OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1027 OG 70
Reissue Applications Filed	1027 OG 70
Request for Reexamination Filed	1027 OG 70
National Inventors Day	1027 OG 71
Effect on Small Entity Status of License	1027 OG 71
Procedure for Handling Amendments	1027 OG 71
Registration to Practice	1027 OG 71
U.S. Government Owned Inventions	1027 OG 72
Patents Available for License or Sale	1027 OG 72
Trademark Data Exchange	1027 OG 75
Patent Certificates of Correction	1027 OG 76
Disclaimers	1027 OG 76
Automation Executive Summary	1027 OG 76
PTO 1982 Master Plan for Automating Office Operations	1027 OG 77
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1027 OG 108
Condition of Patent Applications	1027 OG 109
Reexaminations	1027 OG 111
Reissue Patents Granted (31,140)	429
Plant Patents Granted (4,980)	433
Patents Granted	
General and Mechanical (4,371,983)	435
Chemical (4,372,743)	691
Electrical (4,373,111)	797
Design Patents Granted (267,830)	833
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Designs and Plant Patentees	PI 42
Classification of	
Patents (Including Reissues and Reexaminations)	PI 45
Designs and Plants	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs and Plants	PI 49
Change of Address Form and Subscription Order Form	Back Page

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,999,193, Re. S.N. 401,536, Filed July 26, 1982, Cl. 354/33, AUTOMATIC CONTROL INDICATION DEVICE IN AN AUTOMATIC CONTROL TYPE ELECTRONIC FLASH UNIT, Hiroshi Hasegawa, Owner of Record: *Nippon Kogaku K.K., Tokyo, Japan,* Attorney or Agent: John M. Fitzpatrick, et al., Ex. Gp.: 211

4,230,047, Re. S.N. 436,926, Filed Oct. 26, 1982, Cl. 105/197D, RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY, Donald Wiebe, Owner of Record: *A. Stucki Co., Pittsburgh, Pa.,* Attorney or Agent: E. Wallace Breisch, et al., Ex. Gp.: 312

4,230,372, Re. S.N. 437,297, Filed Oct. 28, 1982, Cl. 299/39, DUAL ROCK CUTTER WHEEL TRENCHER, Edward N. Marten, Owner of Record: *Inventor,* Attorney or Agent: E. Mickey Hubbard, et al., Ex. Gp.: 356

4,276,557, Re. S.N. 429,299, Filed Sept. 30, 1982, Cl. 427/85, METHOD FOR MAKING INTEGRATED SEMICONDUCTOR CIRCUIT STRUCTURE WITH FORMATION OF TI OR TA SILICIDE, Hyman J. Levinstein, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 162

4,306,128, Re. S.N. 437,144, Filed Oct. 27, 1982, Cl. 200/144B, VACUUM CIRCUIT INTERRUPTER, Yoshiyuki Innami, et al., Owner of Record: *Kabushiki Kaisha Meidensha, Tokyo, Japan,* Attorney or Agent: Allan M. Lowe, et al., Ex. Gp.: 215

4,318,162, Re. S.N. 438,682, Filed Nov. 3, 1982, Cl. 362/226, SNAP IN COUPLING ASSEMBLY FOR A VEHICLE HEADLAMP, Jiri G. Sip, Owner of Record: *General Electric, New York, N.Y.,* Attorney or Agent: Norman C. Fulmer, et al., Ex. Gp.: 221

4,318,323, Re. S.N. 394,606, Filed July 2, 1982, Cl. 83/168, SLAVE BLADE SCRAPERS FOR A BAND SAW, John E. Voorhees, et al., Owner of Record: *Hobart Corp., Troy, Ohio,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 324

4,323,127, Re. S.N. 438,406, Filed Nov. 1, 1982, Cl. 173/53, ELECTRICALLY OPERATED IMPACT TOOL, James D. Cunningham, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Wagner, et al., Ex. Gp.: 323

4,324,929, Re. S.N. 430,553, Filed Sept. 30, 1982, Cl. 568/54, PROCESS FOR THE PREPARATION OF ORTHO-(HYDROCARBYLTHIO)-PHENOLS, Bonnie G. McKinnie, et al., Owner of Record: *Ethyl Corp., Richmond, Va.,* Attorney or Agent: Donald L. Johnson, et al., Ex. Gp.: 122

4,332,839, Re. S.N. 429,299, Filed Sept. 30, 1982, Cl. 427/85, METHOD FOR MAKING INTEGRATED SEMICONDUCTOR CIRCUIT STRUCTURE WITH FORMATION OF TI OR TA SILICIDE, Hyman J. Levinstein, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 162

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,319,029, Reexam. No. 90/000,303, Requested: Dec. 3, 1982, Cl. 337/276, HIGH-VOLTAGE FUSES HAVING ZIG-ZAG-SHAPED FUSE LINK, Philip C. Jacobs, Jr., Owner of Record: *Gould, Inc., Rolling Meadows, Ill.,* Attorney or Agent: Frederick A. Goettel, Jr., Ex. Gp.: 212 Requester: Charles W. Mackinnon, Rolling Meadows, Ill.

3,634,228, Reexam. No. 90/000,307, Requested: Dec. 14, 1982, Cl. 210/636, STERILE WASHING METHOD AND APPARATUS, Allen Latham, Jr., Owner of Record: *Requester,* Attorney or Agent: Hamilton, Brook, et al., Ex. Gp.: 176, Requester: Haemonetics Corp., Braintree, Mass.

4,059,405, Reexam. No. 90/000,312, Requested: Jan. 12, 1983, Cl. 436/44, METHOD AND APPARATUS FOR ANALYSIS OF CONSTITUENT CARRIED IN FIBROUS MEDIUM, Lester A. Sodickson, et al., Own-

er of Record: *Damon Corp., Needham Height, Mass.*, Attorney or Agent: Kenway & Jenney, Ex. Gp.: 173, Requester: American Hospital Supply Corp., Miami, Fla.

National Inventors Day

The Patent and Trademark Office and the National Council of Patent Law Associations will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 12, 1983, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 13, 1983, from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 11, 1983, at 5:00 p.m. The removal of all personal property from the Search Room by the early closing time would be appreciated.

GERALD J. MOSSINGHOFF,
Nov. 12, 1982. *Commissioner of Patents and Trademarks.*

Effect on Small Entity Status of License Pursuant to 35 USC 202(c) (4)

Public Law 96-517 added a new chapter 38 to Title 35 of the United States Code entitled "Patent Rights in Inventions Made With Federal Assistance." Under the provisions of the statute, each funding agreement between a Federal agency and an individual, small business firm or nonprofit organization must provide, inter alia, that ". . . the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid up license to practice or have practiced for or on behalf of the United States any subject invention . . ." See 35 U.S.C. 202(c) (4).

Under provisions of 37 CFR 1.9 and 1.27, an independent inventor, small business concern or nonprofit organization cannot qualify for reduced patent fees if it has assigned, granted, conveyed or licensed or is under an obligation under contract or law to assign, grant, convey or license any rights in the invention to other than an individual who could be classified as an independent inventor if that person had made the invention, a small business concern or a nonprofit organization. The Federal agencies do not qualify as nonprofit organizations for paying reduced patent fees under the rules. Applying this construction to the licensing of an invention to a Federal agency by an independent inventor, small business concern or nonprofit organization pursuant to a funding agreement under 35 U.S.C. 202(c) (4) would preclude their qualifying for paying reduced fees. This, however, would frustrate the intent of Public Law 97-247 and Public Law 96-517 when taken together.

This notice will serve as clarification that an independent inventor, small business concern or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a Federal agency pursuant to 35 U.S.C. 202(c) (4). A license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c) (4) does not constitute a license for purposes of 37 CFR 1.9 or a transfer of rights for purposes of 37 CFR 1.27. Any other license or rights to a Federal agency will, of course, preclude qualification as a small entity for purposes of paying reduced fees.

Applicants who have previously paid fees which were not reduced for small entity status because of a license to a Federal agency pursuant to 35 U.S.C. 202(c) (4) may claim a refund by filing the proper verified statement as required by 37 CFR 1.27 and by making reference to this notice.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents and Trademarks.*

Procedure for Handling Amendments under 37 CFR 1.116

On Oct. 1, 1982, pursuant to Public Law 97-247, the Patent and Trademark Office discontinued the previous practice in patent applications of extending without fee the shortened statutory period for response to a final rejection upon the filing of a timely first response to a final rejection (37 CFR 1.116). Since Oct. 1, 1982, applicants are able to obtain additional time for a first or subsequent response to a final rejection by petitioning and paying the appropriate fee under 37 CFR 1.136(a), provided the additional time does not exceed the six month statutory period.

In order to continue to encourage the early filing of any first response after a final rejection and to take care of any situations in which the examiner does not timely respond to a first response after final rejection which is filed early in the period for response, the Office is changing the manner in which the period for response is set on any final rejection mailed after Feb. 27, 1983.

Under the changed procedure, if an applicant initially responds within two months from the date of mailing of any final rejection setting a three-month shortened statutory period for response and the Office does not mail an advisory action until after the end of the three-month shortened statutory period, the period for response for purposes of determining the amount of any extension fee will be the date on which the Office mails the advisory action advising applicant of the status of the application, but in no event can the period extend beyond six months from the date of the final rejection. This procedure will apply only to a first response to a final rejection and will be implemented by including the following language in each final rejection mailed after Feb. 27, 1983:

> A shortened statutory period for response to this final action is set to expire three months from the date of this action. In the event a first response is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than six months from the date of this final action.

For example, if applicant initially responds within two months from the date of mailing of a final rejection and the examiner mails an advisory action before the end of three months from the date of mailing of the final rejection, the shortened statutory period will expire at the end of three months from the date of mailing of the final rejection. In such a case, any extension fee would then be calculated from the end of the three-month period. If the examiner, however, does not mail an advisory action until after the end of three months, the shortened statutory period will expire on the date the examiner mails the advisory action and any extension fee may be calculated from that date.

Statutory periods set in Office actions mailed before Feb. 28, 1983, will not be effected by this change in procedure.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents and Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Mar. 11, 1983.

Armstrong, R. Craig, P.O. Box 790, Waterloo, Ontario, Canada N2J 4C2
Flint, J. Howard, Jr., 1114 Dead Run Dr., McLean, Va. 22101
Griffen, Susan H., 4840 Bradley Blvd., Chevy Chase, Md. 20815
Koris, David J., 52 Gray Rd., Andover, Mass. 01810

DONALD J. QUIGG,
Jan. 11, 1983. *Chairman, Committee on Enrollment.*

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-279,443. LTR-VECTORS. Dept. of Health & Human Services.

SN 6-360,424. HUMAN USE FOR THE COMPOUND 4-CARBOXYPHTHALATO (1,2-DIAMINOCYCLOHEXANE)-PLATINUM (II) AND ALKALI METAL SALTS THEREOF. Dept. of Health & Human Services.

SN 6-417,625. METHOD OF INHIBITION OF NEURAL DECLINE WITH AGING BY RETARDATION OR COUNTER-ACTION. Dept. of Health & Human Services.

SN 6-330,959. MONOCLONAL ANTIBODIES REACTIVE WITH HUMAN BREAST CANCER. Dept. of Health & Human Services.

SN 6-335,155. 1,4-BIS (2'-CHLOROETHYL)-1,4-DIAZABICYCLO (2.2.1)-HEPTANE SALTS AND METHOD OF PREPARATION THEREOF. Dept. of Health & Human Services.

SN 6-367,470. ANTILEUKEMIC 1,4-BIS(2'-CHLOROETHYL)-1,4-DIAZABICYCLO (2.2.1)-HEPTANE SALTS AND METHOD OF PREPARATION THEREOF. Dept. of Health & Human Services.

SN 6-423,241. INOSINE-5'-MONOPHOSPHATE (IMP) DEHYDROGENASE INHIBITORS. Dept. of Health & Human Services.

SN 6-443,682. MONOCLONAL ANTIBODIES TO HERPES SIMPLEX VIRUS TYPE I POLYPEPTIDES. Dept. of Health & Human Services.

SN 6-389,118. POLYMER BOUND DYES PREPARED BY DIAZO COUPLING REACTIONS WITH POLY (ORGANOPHOSPHAZENES). Dept. of Health & Human Services.

SN 6-352,599. ANTIVIRAL ACTIVITIES OF DANSYLCADAVERINE AND CLOSELY RELATED COMPOUNDS. Dept. of Health & Human Services.

SN 6-426,440. DETECTION OF AGRICULTURAL CONTRABAND IN BAGGAGE. Dept. of Agriculture.

SN 6-408,569. SYNTHETIC PHEROMONE 8-METHYL-2-DECONOL PROPANOATE AND ITS USE IN CONTROLLING CORN ROOTWORMS. Dept. of Agriculture.

SN 6-423,404. TREATMENT OF RICE FLOUR TO OBTAIN IMPROVED QUALITY BAKED PRODUCTS. Dept. of Agriculture.

SN 6-340,919. HEAT ABSORBING JACKET FOR HIGH INTENSITY LAMPS. Dept. of Agriculture.

Patents Available for License or Sale

3,961,386. TOILET SEAT COVER. *Ferdinand Beno,* 820 S. Park Ter., Suite 204, Chicago, Ill. 60605.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #1, Los Angeles, Calif. 90045.

4,278,163. WALL MOUNTED LOG CHUTE. *Wayne K. Tomich Kasper T. Co.,* 6475 Walsh Rd., Gagetown, Mich. 48735.

4,300,884. CASTING COLLAR FOR DENTAL IMPRESSION TRAY. *Hector Camacho,* 99-72 66 Rd. Forest Hills N.Y. 11374.

4,340,122. MOUNTED DRILLING APPARATUS. *Salzgitter, Maschinen und Anlagen Aktiengesellschaft Salzgitter,* Federal Republic of Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave. New York, N.Y. 10017.

4,342,384. MEDAL RUMINANT SLOT MACHINE GAMES. *Sayama Precision Industrial Co., Ltd.,* Sayama, Japan. Please direct all correspondence to: Holman & Stern, 2401 Fifteenth St., N.W., Washington, D.C. 20009.

4,345,238. SIGNALLING DEVICE FOR USE IN AUTOMOTIVE AND LIKE VEHICLES. *Richard L. Weir,* 2217 Grant Ave., Dayton, Ohio 45406.

Kimball International, Inc. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under these patents should be addressed to H.E. Thyen, Kimball International, Inc., 1549 Royal St., Jasper, Ind. 47546.

3,255,294. PERCUSSION CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT.

3,263,018. DIODE DISCONNECT CIRCUIT, FOR ELECTRONIC MUSICAL INSTRUMENTS, ISOLATING VARIABLE LOAD MEANS FROM TONE GENERATOR MEANS.

3,286,013. ELECTRONIC VIBRATO DEVICE WITH PLURAL MANUALS.

3,297,812. GATED FUNCTION SWITCHES IN ELECTRIC ORGAN.

3,309,454. ELECTRICAL MUSICAL INSTRUMENT AUTOMATICALLY PRODUCING SELECTED RHYTHMS.

3,310,622. KEY SWITCHING FOR ELECTRIC ORGAN.

3,430,530. MUSIC SYSTEM.

3,342,967. PUSHBUTTON SWITCH.

3,359,358. CHORD ORGAN SWITCHING CIRCUIT FOR SELECTIVELY PLAYING EITHER CHORDS OR SINGLE NOTES BY DEPRESSING ONE KEY.

4,270,431. GLIDE CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT.

4,262,575. QUASI-RANDOM PHASE SHIFT FOR AN ELECTRONIC MUSICAL INSTRUMENT.

3,327,047. COMBINATION OF SELECTOR SWITCH AND KNEE CONTROL.

3,389,211. ELECTRONIC KEYER.

3,524,009. PERCUSSION RIBBON DEVICE FOR KEYBOARD MUSICAL INSTRUMENT.

3,681,507. ELECTRONIC ORGAN VOICING CONTROL MOUNTED ON VOICE TAB.

3,717,065. KEY INDICATING DEVICE.

3,871,262. ELECTRONIC ORGAN HAVING DELAYED FILL IN.

3,990,339. ELECTRIC ORGAN AND METHOD OF OPERATION.

4,073,209. METHOD AND CIRCUITRY FOR DIGITAL-ANALOG FREQUENCY GENERATION.

4,112,802. ORGAN CIRCUITRY FOR PROVIDING FILL NOTES AND A METHOD OF OPERATING THE ORGAN.

4,129,055. ELECTRONIC ORGAN WITH CHORD AND TAB SWITCH SETTING, PROGRAMMING AND PLAYBACK.

4,147,085. ELECTRONIC ORGAN HAVING MEMORY CIRCUIT.

4,152,965. ORGAN CIRCUIT AND METHOD OF OPERATION.

4,191,083. METHOD AND APPARATUS FOR MEMORIZING AN ACCOMPANIMENT PASSAGE.

4,202,236. CHORD PATTERN GENERATOR.

4,210,054. HIGH NOTE PRIORITY MONOPHONIC BRASS KEYER SYSTEM.

4,220,068. METHOD AND APPARATUS FOR RHYTHMIC NOTE PATTERN GENERATION IN ELECTRONIC ORGAN.

4,228,714. MULTIPLEX CHIME GENERATOR.

4,236,436. ELECTRONIC MUSIC SYNTHESIZER.

4,299,154. ELECTRONIC RHYTHM GENERATOR.

4,300,436. BLIND CAPTURE SYSTEM.

General Battery Corp. is prepared to grant nonexclusive licenses upon reasonable terms and conditions under the following patents. Inquiries with respect to licenses under General Battery Corp. patents should be addressed to Benasutti Associates, Ltd., Suite 1020 Suburban Station Bldg., 1617 John F. Kennedy Blvd., Philadelphia, Pa. 19103.

3,822,585. LEAK TESTER FOR BATTERIES.

3,861,575. APPARATUS FOR THERMAL RELAY WELDING.

3,938,368. AUTOMATIC AIR LEAK TESTING APPARATUS.

3,980,126. AUTOMATED POST BURN STATION.

3,982,624. APPARATUS AND METHOD FOR HANDLING AND STACKING BATTERY PLATES AND THE LIKE.

4,001,066. INTERCHANGE AND ALIGNMENT APPARATUS AND METHOD FOR HEATED PLATEN HEAT SEALING MACHINE.

4,080,732. ENVELOPER FOR WRAPPING THE PLATES OF AN AUTOMOTIVE STORAGE BATTERY.

4,081,093. APPARATUS FOR DUMPING AND COLLECTING CORROSIVE SUBSTANCES FROM AUTOMOTIVE BATTERIES.

4,158,382. APPARATUS FOR CASTING LEAD INTO PLASTIC FOR SIDE TERMINAL BATTERIES.

4,166,210. ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE.

4,173,326. CAST ON MOLD INSERTS.

4,381,325. BASKET DESIGN.

The following patents are offered by sale or license by Dana Corp.

3,460,506. MARINE OUTDRIVE LATCH.

3,469,606. MULTI-PORT ROTARY AND RECIPROCATING FLUID CONTROL VALVE.

3,470,844. MARINE OUTDRIVE LATCH.

3,529,617. FLUID FLOW PROPORTIONER.

3,626,467. MARINE DRIVE.

3,631,671. EXHAUST SYSTEM FOR MARINE OUTDRIVE.

3,752,437. MOLD CAPABLE OF BEING OPENED AND CLOSED.

3,754,717. COLLAPSIBLE MANDREL.

3,802,975. METHOD OF MAKING A CONTAINER.

3,842,691. PLANETARY TRANSMISSION.

3,854,620. CONTAINER.

For further information contact: Robert M. Leonardi Dana Corp., P.O. Box 1000, Toledo, Ohio 43697.

The following patents are offered by Robert V. Albertson. Correspondence should be addressed to WICKS & NEMER, Suite 1407 Soo Line Bldg., Minneapolis, Minn. 55402.

3,585,855. VEHICLE ENGINE TESTING APPARATUS.

3,673,701. COMBINED BUILDING HUMIDIFIER AND CLOTHES DRYER.

3,675,500. STEPWISE MOVABLE V-BELT DRIVE PULLEY.

3,676,013. AXIAL FLOW PUMP.

3,698,256. TRANSMISSION BELT-DRIVE SYSTEM.

The following patents are offered by Intercontinental Ideas, 704 West 34th St., Baltimore, Md. 21211. Attn: Norwood R. Warehime.

4,346,902. HANDBALL GAME UTILIZING PAIRED TETHERED BALLS.

4,339,133. MALLET DRIVEN SLIDING DISC GAME AND APPARATUS.

4,336,942. 3-WAY MINI-TENNIS GAME AND APPARATUS.

4,330,131. MULTI-TETHERED BALL ASSEMBLAGES AND THEIR USES.

4,346,884. MULTI-TEAM TUG-OF-WAR APPARATUS.

4,335,881. MULTI-SECTIONAL ASSEMBLED BASKET GOALS AND THEIR GAMES USES.

4,344,628. TURNSTILE GOAL AND GAMES USAGE.

4,352,255. GROUP USE TOY STRUCTURAL CONSTRUCTION SET.

3,415,941. ORGAN CIRCUIT.

3,422,454. ELECTRICAL MUSICAL INSTRUMENTS.

3,439,569. ELECTRICAL MUSICAL INSTRUMENT.

3,466,090. TAB INTERLOCK.

3,446,904. KEY SYSTEM FOR ELECTRICAL MUSICAL INSTRUMENT.

3,465,087. ELECTRIC ORGAN CIRCUIT.

3,472,114. COMBINATION TAB SELECTOR.

3,509,263. ELECTRONIC MUSICAL INSTRUMENT KEYING SYSTEM INCLUDING ATTACK AND DECAY CONTROL.

3,509,373. PEAK LIMITER.

3,510,565. ELECTRONIC ORGAN WITH MUSICAL NOTES COMPRISING BEAT FkEQUENCIES OF A REFERENCE GENERATOR AND NOTE GENERATORS UTILIZING MAGNETOSTRICTIVE OSCILLATORS.

3,514,723. TONE CONTROL CIRCUIT COMPRISING A SINGLE POTENTIOMETER.

3,515,791. PIANO KEYING CIRCUIT FOR ELECTRICAL MUSICAL INSTRUMENT, WITH SELECTIVE BY-PASS CIRCUITS FOR OTHER INSTRUMENTAL EFFECTS.

3,518,352. RHYTHM GENERATING CIRCUIT FOR MUSICAL INSTRUMENT.

3,519,722. VARIABLE IMPEDANCE MEMBER FOR ELECTRONIC MUSICAL INSTRUMENT.

3,525,951. ELECTRICAL ORGAN CIRCUIT.

3,543,191. CONTROLLABLE FILTER NETWORK.

3,543,281. ELECTRONIC MUSICAL INSTRUMENT DUAL PURPOSE GATE AND KEYING CIRCUIT.

3,560,628. MULTI-CHANNEL KEY SWITCH CIRCUIT.

3,560,629. MANUALLY-CONTROLLED CIRCUIT.

3,593,187. NOISE GENERATOR AND ACTUATING CIRCUIT FOR MUSICAL INSTRUMENTS.

3,665,088. KEYER CIRCUIT FOR AN ELECTRONIC MUSICAL INSTRUMENT WHEREIN A SINGLE SWITCH MAY ACTUATE A SINGLE NOTE OR A CHORD.

3,693,052. ELECTRICAL COMPONENT MOUNTING.

3,710,480. TERMINAL PIN INSTALLING MACHINE.

4,315,452. PERCUSSIVE MODULATOR FOR ELECTRONIC ORGAN.

3,778,525. ELECTRONIC MUSICAL INSTRUMENT WITH PHASE SHIFT TREMULANT SYSTEM.

3,844,192. CHORD CONTROL SYSTEM FOR ELECTRONIC ORGAN.

3,935,784. DOUBLE TOUCH KEY FOR MUSICAL INSTRUMENTS.

3,941,024. ELECTRICAL MUSICAL INSTRUMENT WITH AUTOMATIC SEQUENTIAL TONE GENERATION.

3,948,139. ELECTRONIC SYNTHESIZER WITH VARIABLE/PRESET VOICE CONTROL.

3,954,038. ELECTRICAL MUSICAL INSTRUMENT WITH AUTOMATIC SEQUENTIAL TONE GENERATION.

3,960,043. FILTER CIRCUIT.

4,019,417. ELECTRICAL MUSICAL INSTRUMENT WITH CHORD GENERATION.

4,031,786. TONE SELECTOR CIRCUIT WITH MULTIPLEXED TONE DATA TRANSFER.

4,046,047. NOTE SELECTOR CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT.

4,059,039. ELECTRICAL MUSICAL INSTRUMENT WITH CHORD GENERATION.

4,080,861. CHORUS CONTROL FOR ELECTRONIC MUSICAL INSTRUMENT.

4,106,385. DIGITAL ARPEGGIO GENERATING DEVICE.

4,173,166. TAB SWITCH MECHANISM FOR MUSICAL INSTRUMENTS.

4,186,636. DIGITAL CHORD GENERATION FOR ELECTRONIC MUSICAL INSTRUMENTS.

4,188,848. DIGITAL TONE AND CHORD GENERATORS.

4,248,121. PULSE GENERATOR FOR PRODUCING THE HARMONIC EQUIVALENT OF A SAWTOOTH WAVE.

4,311,076. ELECTRONIC MUSICAL INSTRUMENT WITH HARMONY GENERATION.

4,315,452. PERCUSSIVE MODULATOR FOR ELECTRONIC ORGAN.

3,410,947. SOUND REPRODUCING SYSTEM.

3,424,850. ACOUSTIC SYSTEM

3,433,880. PERCUSSION SYSTEM.

3,470,785. TEACHING AID FOR ELECTRIC KEYBOARD INSTRUMENT.

3,617,605. PERCUSSION KEYER CIRCUIT.

3,740,449. ELECTRIC ORGAN WITH CHORD PLAYING AND RHYTHM SYSTEMS.

Re. 28,999. AUTOMATIC RHYTHM SYSTEM PROVIDING DRUM BREAK.

3,837,254. ORGAN PEDAL TONE GENERATOR.

3,954,039. CHORD SELECTION SYSTEM FOR A MUSICAL INSTRUMENT.

3,955,460. ELECTRONIC MUSICAL INSTRUMENT EMPLOYING DIGITAL MULTIPLEXED SIGNALS.

3,977,291. ATTENUATOR NETWORK FOR MUSICAL INSTRUMENT KEYING SYSTEM.

4,012,982. PERCUSSION PROCESSOR FOR ELECTRONIC MUSICAL INSTRUMENT.

4,014,238. TONE SIGNAL WAVEFORM CONTROL NETWORK FOR MUSICAL INSTRUMENT KEYING SYSTEM.

4,072,078. SYSTEM FOR AUTOMATICALLY PRODUCING TONE PATTERNS.

4,150,599. DIGITAL KEYING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT.

4,202,239. TONE GENERATOR KEYER CONTROL SYSTEM.

3,477,330. LAMINATED SOUNDBOARD FOR A STRING INSTRUMENT.

4,216,691. OCTAVE ASSIGNMENT FOR ELECTRONIC MUSICAL INSTRUMENT.

4,352,497. FOOTBALL (SOCCER) GAME WITH MOBIL GOALS.

The General Electric Co. is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers and requests publication of this notice in the Official Gazette:

4,227,944. METHOD OF MAKING COMPOSITE CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS.

4,228,212. COMPOSITE CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS AND METHOD OF MAKING SAME.

4,247,830. PLASMA SPRAYED WICKS FOR PULSED METAL VAPOR LASERS.

4,284,664. FIBER REINFORCED CERAMICS WITHOUT PRESSING OR SINTERING USING A SLURRY COMPRISING A SILICATE AND A POWDERED CERAMIC.

4,284,979. CODING SYSTEM FOR SIMULTANEOUSLY SIGNALLING SELECTED ONES OF A PLURALITY OF DEVICES.

4,291,278. PLANAR MICROWAVE INTEGRATED CIRCUIT POWER COMBINER.

4,297,880. DOWNHOLE PRESSURE MEASUREMENTS OF DRILLING MUD.

4,302,686. CHARGE TRANSFER SERIAL-TO-PARALLEL CONVERTER.

4,304,451. INTERCONNECTION TECHNIQUE FOR DOWNHOLE INSTRUMENTATION.

4,324,760. HYDROGEN DETECTOR.

4,324,761. HYDROGEN DETECTOR.

4,328,417. BANDWIDTH COMPENSATED QUARTER-WAVE COUPLED POWER COMBINER.

4,344,235. LEVITATED BALL INCLINOMETER.

4,279,656. LIGHT-TRANSMITTING SILICON NITRIDE.

4,279,657. LIGHT-TRANSMITTING SILICON NITRIDE.

4,310,996. CEMENT REINFORCED GYPSUM FOAM WITH MINERAL WOOL.

4,316,938. HIGH DENSITY CARBON ADSORBENT COMPOSITE.

4,331,080. COMPOSITE HIGH EXPLOSIVES FOR HIGH ENERGY BLAST APPLICATIONS.

4,351,867. THERMAL INSULATION COMPOSITE OF CELLULAR CEMENTITIOUS MATERIAL.

Applications for licenses should be addressed to: Division Patent Counsel, Space Systems Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa. 19101

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,325,583. LOW AXIAL STIFFNER THRUST BEARING.

Application for license may be addressed to: Patent Counsel, Mobile Radio Products Department, General Electric Co., Mountain View Rd., Lynchburg, Va. 24502.

4,361,821. CAPACITOR COUPLING ARRANGEMENT FOR UHF RESONANT STRUCTURE.

Applications for license may be addressed to General Electric Co., Motor Business Group, 1635 Broadway P.O. Box 2204, Fort Wayne, Ind. 46801-2204.

4,274,072. THERMOSTAT AND ASSEMBLY THEREFOR.

Applications for license may be addressed to: Patent Counsel, Aerospace Control Systems Department, General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902.

4,157,583. CIRCUIT BOARD CLAMPING ASSEMBLY.

4,207,541. COOLING JACKET FOR LASER FLASH LAMPS.

Applications for license under the following patents should be addressed to: Mr. Arnold E. Renner, Division Patent Counsel, Industrial Electronics Systems Division, General Electric Co. 1501 Roanoke Blvd., Salem , Va. 24153.

3,370,676. MINE HOIST SYSTEM INCLUDING A MAIN COUNTER FOR LEVEL DETERMINATION AND A JOG COUNTER FOR LEVEL OFFSET.

3,425,515. DIGITAL CONTROL FOR MINE HOIST SYSTEM.

3,440,568. GENERATOR FOR AMPLITUDE AND FREQUENCY MODULATED LOW-FREQUENCY ALTERNATING VOLTAGES.

3,500,386. COUNTER CONTROL CIRCUIT FOR AN ANALOG TO DIGITAL CONVERTER.

3,559,017. PULSE SYNCHRONIZING MOTOR CONTROL.

3,601,674. CONTROL SYSTEM FOR FIRING SCR'S IN POWER CONVERSION APPARATUS.

3,611,097. DIGITAL CONTROL SYSTEM FOR AC TO DC POWER CONVERSION APPARATUS.

4,041,361. CONSTANT TORQUE INDUCTION MOTOR DRIVE SYSTEM.

4,316,185. BATTERY MONITOR CIRCUIT.

Trademark Data Exchange

Under the provisions of Section 6(a) of title 35, United States Code, the Commissioner of Patents and Trademarks has entered into an exchange agreement with N.V. Compu-Mark S.A., an international firm headquartered in Mortsel, Belgium, that is involved in worldwide trademark searching, for the preparation of a computer data base of the text of all active trademark registrations. In return, the Patent and Trademark Office will provide Compu-Mark with copies of selected Office documents, records and trademark information on computer tapes and future updates to the data base through 1992.

The PTO would welcome proposals from other interested suppliers to provide the same or equivalent materials and services. Proposals received by Mar. 31, 1983 will be evaluated and considered by the Office.

Additional information, including copies of the PTO-Compu-Mark agreement, may be obtained from: J. Howard Bryant, Administrator for Automation, U.S. Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-3967

GERALD J. MOSSINGHOFF,
Jan. 11, 1983. *Commissioner of Patents and Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Feb. 8, 1983

Pp. 4,913	4,297,476	4,342,516	4,354,613
Re. 29,660	4,304,677	4,342,740	4,355,351
Re. 30,883	4,305,063	4,342,854	4,356,124
Re. 30,990	4,307,677	4,343,042	4,356,634
Re. 31,007	4,309,977	4,343,080	4,356,645
3,759,728	4,311,381	4,343,194	4,357,051
3,912,800	4,311,832	4,343,778	4,357,146
3,947,327	4,313,850	4,345,718	4,357,151
4,002,758	4,315,004	4,345,725	4,357,399
4,028,188	4,315,678	4,346,178	4,357,632
4,122,247	4,315,796	4,347,198	4,358,038
4,124,750	4,315,997	4,348,203	4,358,236
4,178,231	4,318,916	4,348,469	4,358,305
4,208,408	4,323,110	4,348,667	4,358,518
4,220,763	4,326,385	4,349,094	4,358,841
4,221,260	4,328,373	4,349,299	4,358,919
4,222,715	4,328,437	4,349,456	4,359,104
4,224,034	4,329,030	4,349,680	4,359,167
4,230,816	4,329,913	4,350,200	4,359,250
4,230,966	4,330,155	4,350,487	4,359,322
4,234,806	4,333,693	4,350,513	4,359,607
4,238,317	4,334,475	4,350,536	4,359,678
4,241,415	4,334,775	4,350,990	4,359,820
4,244,602	4,335,262	4,351,513	4,359,821
4,258,850	4,336,129	4,351,532	4,359,874
4,259,694	4,336,465	4,351,542	4,360,764
4,264,142	4,337,368	4,352,221	4,360,770
4,267,321	4,338,029	4,353,081	4,360,829
4,269,368	4,338,220	4,353,335	4,360,891
4,273,784	4,338,234	4,353,694	4,361,203
4,276,151	4,338,326	4,353,702	4,361,613
4,278,888	4,338,967	4,353,926	4,362,193
4,281,404	4,339,989	4,353,977	
4,283,363	4,340,684	4,354,023	
4,287,935	4,340,713	4,354,200	
4,292,585	4,341,457	4,354,293	
4,297,002	4,342,062	4,354,315	

Disclaimers

3,244,061.—*Monroe H. Sweet,* Binghamton, N.Y.; *Russell P. Easton* and *First-City National Bank of Binghamton, N.Y., administrators of said Monroe H. Sweet, deceased.* DIRECT READING TRI-STIMULUS COLOR ANALYZER. Patent dated Apr. 5, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,244,062.—*Monroe H. Sweet,* Binghamton, N.Y.; *Russell P. Easton* and *First-City National Bank of Binghamton, N.Y., administrators of said Monroe H. Sweet, deceased.* PHOTO-ELECTRICAL SENSITOMETRIC MEASURING APPARATUS. Patent dated Apr. 5, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,294,578.—*Stanley P. Popeck,* Nimmonsburg, N.Y. DEPOSITION OF A METALLIC COAT ON METAL SURFACES. Patent dated Dec. 27, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,368,898.—*Daniel A. Nepela,* Saratoga, Calif. AUTOPOSITIVE FILM AND PAPER AND EMULSIONS THEREFOR. Patent dated Feb. 13, 1968. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,451,902.—*Steven Levinos,* Vestal, N.Y. PROTECTIVE LOCALIZED AREA RESIN COATINGS FOR ELECTROPLATING. Patent dated June 24, 1969. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,477,745.—*James W. Williams,* Los Angeles, and *Phillip K. Proctor,* Anaheim, Calif. QUICK CONNECTION OF PIPE TO DUCTING. Patent dated Nov. 11, 1969. Disclaimer filed Nov. 29, 1982, by the assignee, *Allied Insulation Co. doing business as Permanent Pipe Products Co.*

Hereby enters this disclaimer to claims 1, 5 and 6 of said patent.

3,498,723.—*Gordon W. Nichols,* Binghamton, N.Y. MOVIE CAMERA EXPOSURE INTEGRATOR. Patent dated Mar. 3, 1970. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,596,579.—*John F. Coughlin* and *Ralph I. Berge,* Binghamton, N.Y. EXPOSURE CONTROL AND LOW-LIGHT WARNING SYSTEM. Patent dated Aug. 3, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

4,252,894.—*Felix Viro,* Apalachin, N.Y.; and *Salvatore Emmi,* Portland, Oreg. HYDROPHILIC COLOR COUPLER COMPOSITION CONTAINING DIEPOXIDE. Patent dated Feb. 24, 1981. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

4,297,918.—*Forbes G. deB. Perry,* Forest Row, England. CONTROL SYSTEMS FOR STEPLESSLY-VARIABLE RATIO TRANSMISSIONS. Patent dated Nov. 3, 1981. Disclaimer filed Nov. 4, 1982, by the assignee, *National Research Development Corp.*

Hereby enters this disclaimer to claims 4 and 5 of said patent.

Automation Executive Summary

In view of the many requests for and expressions of interest in the Section 9 automation report, which was submitted to the Congress on Dec. 13, 1982, an executive summary (Volume I) of that report is reprinted below. Volumes II and III, which are much more detailed and technical in nature, are available in limited quantities. Copies may be requested from Dr. J. Howard Bryant, Administrator for Automation, Patent and Trademark Office, Washington, D.C. 20231.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Jan. 13, 1983.

PREFACE

This document presents the Patent and Trademark Office (PTO) 1982 master plan for automating office operations. The plan is the outgrowth of a recognized need to improve patent and trademark operations through application of computer technology. Preparation of the plan was mandated by Section 9 of P.L. 96-517 which states:

> "The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify and if necessary develop or have developed computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future."

The goal of the plan is to automate the PTO by the 1990's. The plan was developed considering the mission of the PTO, existing automated systems and mission support needs, and areas where automation will produce operational benefits. Particular attention was given to program and management requirements achievable within the limits of current and emerging automation technology. The plan will be revised and updated annually to reflect technological changes and the availability of resources.

It is proposed that automation be accomplished in three stages. During the first stage, one patent group (Group 220), which deals with all areas of technology, would be automated. Supporting pre-examination, post-examination, classification, and management information would be automated as well. In addition to Group 220, all of trademarks would be automated. The other patent groups and functions would be automated in the second stage. The final stage would expand dissemination and access capabilities and make possible worldwide electronic access to patent and trademark information.

A PTO team from program and support offices, coordinated by the Office of Finance and Planning, prepared the plan. It was augmented by a team from the MITRE Corporation which provided an independent assessment of automation technology. Commissioner Mossinghoff appointed a special advisory committee to review and evaluate the draft plan. Experts in the field of automation from other government agencies comprised this committee: Dr. Rona B. Stillman, Associate Director (Technical), Directorate of Computer Resources, Headquarters United States Air Force; Mr. James H. Burrows, Director, Institute for Computer Sciences and Technology, National Bureau of Standards; Mr. Melvin S. Day, Director, National Technical Information Service; and Mr. Louis N. Lushina, Director, Information Systems Division, National Aeronautics and Space Administration. Arlene Tripplett, Assistant Secretary for Administration, and Dennis Boyd, Executive Director, Information Resource Management, both with the Department of Commerce, provided guidance and assistance throughout the conduct of the study. In addition, over 600 copies of the draft plan were circulated to individuals, commercial organizations, and interested associations for their comment. The PTO held a public hearing to provide a forum for comment and reaction to the Section 9 requirement of P.L. 96-517. The participation and recommendations by both constituents and vendors provided a valuable contribution to the preparation of the final master plan.

To complete the plan and begin its implementation, centralized management of the automation program was needed to assure that plans will be coordinated and resources effectively used. This was accomplished through the organization of all automation activities into a single office under an Administrator for Automation. To assure continuing top management involvement and guidance as the plan is implemented, an automation coordinating committee, chaired by the Commissioner of Patents and Trademarks and composed of the managers of the program and support offices, was formed. The Commissioner was involved personally in planning this important automation project and approved all key managerial strategies. Among these were decisions to rely heavily on the private sector to provide the automated capabilities that will be required and to offer maximum latitude for private sector involvement in long term automation operations.

Volume 1

AUTOMATING THE PATENT AND TRADEMARK OFFICE

CONTENTS

Mission Needs 1
Future Operations 3
Pre-Examination 7
Examination 9
Post-Examination 11
Trademark Operations 11
Management 13
System Requirements 15
System Development Approach 17
Life Cycle Strategy 19
System Implementation Milestones 22
Cost Estimates 25
Summary 27

Volume 2

AUTOMATION MASTER PLAN

(Separately Bound)

Introduction
Patent Requirements
Trademark Requirements
Management Requirements
Automated System Requirements
Life Cycle Strategy
Plan of Work
Program Costs

Volume 3

AUTOMATION MASTER PLAN APPENDICES

(Separately Bound)

Current Automated Systems
Quantitative Characteristics of PTO Operations
Technology Analyses (unpublished)
Public Testimony Proceedings
Program Cost Estimates (unpublished)

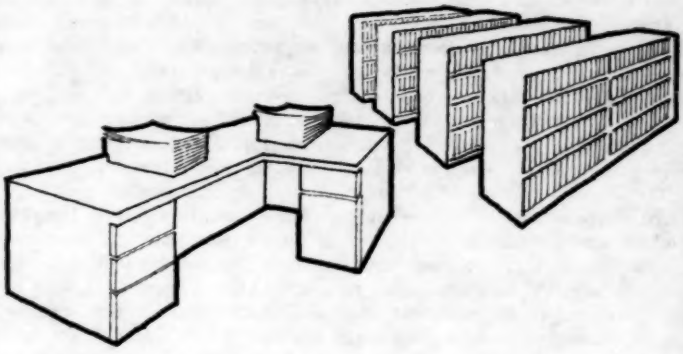
VOLUME 1

AUTOMATING THE PATENT AND TRADEMARK OFFICE

DEPARTMENT OF COMMERCE
Patent and Trademark Office
December, 1982

Mission Needs:

To Reverse Current Trends



- **Search documents are stored and retrieved in an *all-paper hand-file* system—*24 million* documents on file now will double by the year 2000.**
- ***7%* of the 24 million documents are *missing or misfiled.***
- **Error-plagued *manual handling* of *360,000* active cases and *20,000* papers received each day is *reducing productivity.***
- **Decisions to grant patents and register trademarks are increasingly based on incomplete data.**

MISSION NEEDS

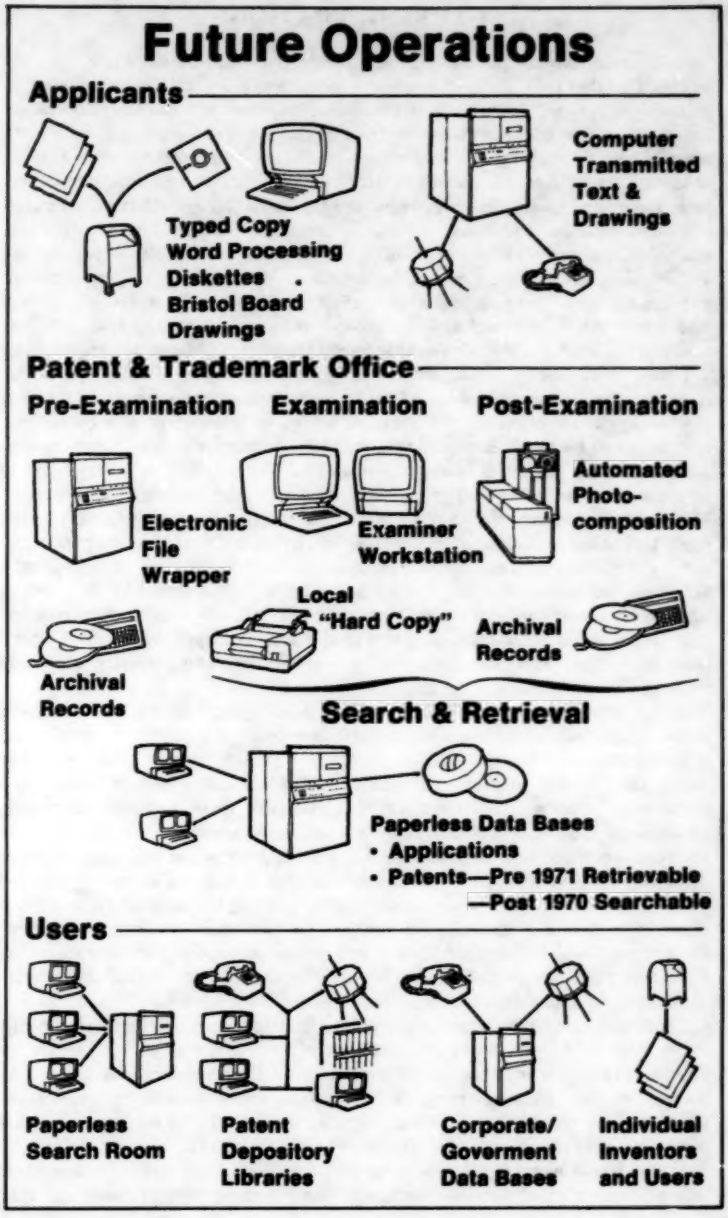
The mission of the Patent and Trademark Office (PTO) is to promote the national economy by administering the provisions of the patent and trademark laws of the United States. Patent laws encourage technological advancement by providing incentives to invent, invest in, and disclose new technology. Trademark laws assist businesses in protecting their investments in the promotion of goods and services and safeguarding consumers against confusion and deception in the market place as to the origin of goods and services.

To carry out this mission, the PTO processes and examines over 100,000 patent and 60,000 trademark applications annually. In the examination process, the PTO compares patent application subject matter to a large body of technological information to determine that the inventions are new and not obvious to someone knowledgeable in that field. The marks shown in new applications are compared to registered product and service brand names to ensure they are not confusingly similar. For the most part, the comparison process is carried out manually by searching paper files which are organized for this purpose. Applications are handled by routing paper copies and maintaining manual control and reporting procedures.

The already large body of information against which applications must be compared is growing rapidly. The continued growth of paper files is at the heart of the problem the PTO faces in carrying out its mission effectively. As the information base increases, the resources necessary to maintain it in a usable form also increase. Since the files are paper and loosely assembled to facilitate searching, their integrity is degrading steadily because of lost or misfiled documents. Up to seven percent of the 24 million document file is missing at any point in time. These factors threaten to compromise the quality, even the viability, of the patent grant and the trademark registration. Processing paper applications requires moving large amounts of paper frequently and matching some 20,000 pieces of mail daily with corresponding files distributed throughout PTO offices. Resources to maintain the search files and the paper handling procedures have been diverted from functions which directly support the PTO mission. As a result, filing receipts have become delayed, responses to correspondence have become slow, papers and files have been lost, backlogs have increased and are reflected in increased application pendency time. The longer pendency periods are in conflict with the mission objectives of quickly conferring rights to inventions, registering trademarks, and disseminating information to the public.

Patent information dissemination is important because of the "multiplier" effect technological disclosures have on further invention and potential infringement. Trademark information dissemination is important because it allows businesses to determine the availability of marks and the existence of potential infringement. Dissemination is limited by paper files located only in the PTO in the Washington, D.C. area. The files are costly to reproduce and maintain in more accessible locations around the country. Similarly, methods of accessing the patent paper file are largely restricted to the use of the patent classification system.

The methods for satisfying mission needs are limited to either increasing staff or developing a more efficient process. The PTO has chosen a balanced course of action which will improve quality and reduce backlogs in the short run by redirecting staff resources to critical operating problems, and in the long run by developing a more efficient process through extensive automation. The development of an automated system to support future operations is one of the highest priority mission needs of the PTO.


Future Operations
Applicants
Typed Copy
Word Processing
Diskettes
Bristol Board
Drawings
Computer
Transmitted
Text &
Drawings
Patent & Trademark Office
Pre-Examination
Examination
Post-Examination
Electronic
File
Wrapper
Examiner
Workstation
Automated
Photo-
composition
Local
"Hard Copy"
Archival
Records
Archival
Records
Search & Retrieval
Paperless Data Bases
• Applications
• Patents—Pre 1971 Retrievable
—Post 1970 Searchable
Users
Paperless
Search Room
Patent
Depository
Libraries
Corporate/
Goverment
Data Bases
Individual
Inventors
and Users

FUTURE OPERATIONS

The primary goal of the automation program is to support more fully all PTO processes so that they are completed in a more timely and efficient manner. This goal will be realized through a virtually paperless patent and trademark operation. Three automation capabilities are key to this concept. First, most paper files and paper handling operations will be replaced by electronic and other computer accessible data bases. Second, communications with applicants and constituents will be in modes and media chosen by them and supported through electronic terminals, telecommunications and other automation technology. Finally, most patent and trademark pre-examination, examination, post-examination, classification, and management control functions will be supported through electronic workstations and automated or computer assisted operations. Through the workstations, data base access will be obtained and routine operations, consistent with standard practices and the intellectual, professional nature of the work, will be performed.

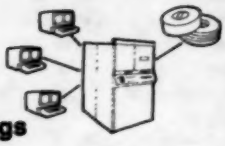
Today, processing is accomplished through predominantly manual operations. A patent application arrives in the office where pre-examination activities—fee processing, bibliographic data base creation, receipting, tentative art unit (or technology) selection, file wrapper preparation, statutory compliance checking and national defense security screening—are performed. Then the application is forwarded to an art unit where, after waiting its turn, the application undergoes examination. This includes a search of U.S. patents, foreign patents, non-patent literature, and related pending applications for possible interference. Next, the examiner prepares official actions, communications, and interview summaries, as appropriate. Following the examination, supervisors and quality control personnel may review the results. Some applications undergo additional processing related to interference, appeals and other matters. Entry of the approved application into a photocomposition data base, fee processing, patent printing, and archiving constitute post-examination. Processing for trademarks is analogous.

In the future system, current paper files will be replaced by electronic text and digital image data bases. The electronic text data base for patents will contain most U.S. patents issued between 1971 and 1975 and all U.S. patents since 1975. The rest of the files will be selectively incorporated. All active trademark registrations will also be stored in an electronic text data base. The image data base will contain all drawings and the entire backfile of text not in the electronic text data base. In addition, the image data base will contain foreign patents and technical reference literature. All pending applications will be included in both the electronic text and image data bases. Currently, all papers relating to an application are collected in a paper folder known as the "file wrapper." In the automated system, an "electronic file wrapper" will tie together all text and images associated with an application. Passwords and other techniques will be used to maintain application confidentiality and protect national security interests.

Communication with an applicant will be conducted in one of three basic modes. Paper applications still will be accepted, but in a standard format to maximize the efficiency of converting them to machine readable form. Applications also will be accepted on word processing media or directly from another computer by telecommunications. The transmission of office actions, receipts, and other correspondence will be in any of the above modes, as chosen by the applicant.

Automation of most operations will require supporting a large variety of users—both internal and external. Internal users will perform their primary functions using

Search & Retrieval



All Post-1970 & Selected Pre-1971 U.S. Patents
- **Searchable Full Text**
- **Computer Retrievable Drawings**

Entire Patent Backfile
- **Searchable by Sub-Classes**
- **Computer Retrievable**
- **Rapid Display in Eye-Easy Form**
- **Available on Microform**

Foreign References and Technical Literature
- **Computer Retrievable**
- **Available on Microform**
- **Automated Input from Foreign Patent Offices**
- **Examiner Selected Input**

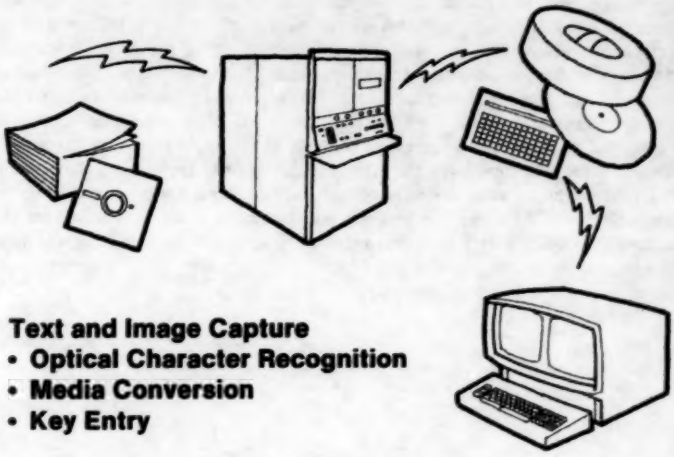
Commercial and Foreign Data Bases

Automated Search Methods
- **Key Word** • **Index** • **Full Text**
- **Thesaurus** • **Classification**

Computer Retrieval of Text and Images
- **Visual Display Terminals**
- **Paper** • **Microform**

electronic workstations to gain access to the electronic data bases and perform other tasks. The workstation will provide easy-to-use controls and procedures with capabilities for satisfying the unique requirements of each user. Capabilities will include search and retrieval of data from the text and the image data bases; the collection, analysis and reporting of management information; data entry and data base maintenance; and a variety of professional and administrative services. These capabilities will allow the functions of pre-examination, examination and post-examination to be accomplished predominantly through the automated system. They will eliminate the need for processing and routing applications and related correspondence in paper form.

Pre-Examination



Text and Image Capture
- **Optical Character Recognition**
- **Media Conversion**
- **Key Entry**

Creation of "Electronic File Wrapper"
- **Date Stamping**
- **Numbering**
- **Classification**
- **Bibliographic Extraction**
- **Text and Image Referencing**

Computer Assisted Preprocessing
- **Statutory Screening**
- **Security Screening**
- **Fee Processing**
- **Receipting**
- **Initial Docketing**

Archival Record of all Papers

Management Data Capture

Communication Mode Chosen by Applicant

Pre-examination

Applications will be submitted to the PTO either in machine readable form on diskette or directly through telecommunications. Alternatively, they may be submitted on paper that can be processed by an optical character reader (OCR) or by keying. After initial processing, the contents of the application will be in a form suitable for processing into the electronic text and image data bases. An "electronic file wrapper" will be created and assigned a serial number through a computer assisted process. The entire contents of the "wrapper" then will be available for direct viewing at an electronic workstation, where it will be reviewed for statutory and rule compliances, screened for national security implications, classified by technology or art area for routing to an examination group, and checked for correct fee submission. Financial transactions will be generated. After these steps, an archival copy will be made. With the entire contents of the application now captured in electronic form and copied for the archives, the original application, if not transmitted electronically, may be destroyed or returned with an acknowledgement receipt.

Beginning with data capture and pre-examination processing, the system will record and maintain a data base that reflects the status of the application through each processing step.

Examination

Automated Examiner Docket Update

Application Review—Electronic File Wrapper Access
- **Bibliographic Data**
- **Text and Images**
- **Reference Documents/Images**

Data Base Search & Retrieval
- **Patents and Applications**
- **Foreign Data Bases**
- **Commercial Data Bases**
- **Optional "Hard Copy"**

Examiner Generated Private Files
- **Document Annotation**
- **Informal Bibliographies**

Office Actions
- **Examiner Generated Using Form Paragraphs**
- **Composition and Editing**
- **Routing for Pool Generation**
- **Automatic Entry in Electronic File Wrapper and Archived**

Application Paper Entered in Electronic File Wrapper & Archived

Professional Services at Electronic Workstation
- **Access to Regulations, Statutes, Operating Procedures**
- **Electronic Mail**
- **Calendar Maintenance**
- **Directory Assistance**
- **Document Distribution**

Examination

After pre-examination, an application will automatically be placed on a patent group's electronic examination list (docket). A supervisor will be able to retrieve and review the application and further assign it to an appropriate art unit and/or examiner by placing it on either a unit or examiner electronic docket.

The examination will be conducted predominantly at an electronic workstation. The examiner will retrieve the electronic file wrapper for application review. The workstation will have multiple display screens so that the examiner may view both the text and the drawings of any document and compare the application text and drawings to those of other patent or reference materials. Examiners will have the ability to print high quality copies of electronic documents. All U.S. patents and pending applications will be searched to detect potential interferences; i.e., other applications with conflicting claims. Through commercial data bases, the examiner may access English translations of foreign patent abstracts and non-patent literature. Examiners may save and annotate electronic copies of these searches in personal electronic files for future reference. Computerized search aids, such as the Master Classification File, the Classification Index, the Manual of Classification, and the classification definitions, will be available to identify appropriate classes/subclasses and patents. Additionally, computerized technical thesauri will be available to help identify equivalent conceptual terms. Ownership assignment files will be accessible to identify other patents by the same inventor or assigned to the same company.

The examiner will prepare the Office action, including suggested changes to specifications and claims of the application, using form paragraphs to limit manual effort and reduce the need for typist assistance. Memoranda of attorney-examiner interviews can also be prepared and sent more easily and speedily. Application changes will be integrated into the data bases which subsequently will be used to print the patent grant. All application modifications and correspondence will be stored, forming an electronic file history, until they can be archived and removed from the on-line system.

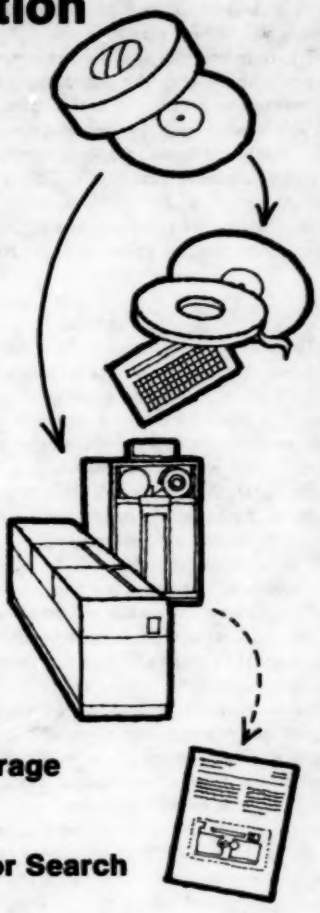
If the examiner has a question about procedure or legal information, the workstation can be used to retrieve the text of references such as the Manual of Patent Examining Procedures, federal regulations, Board of Appeals decisions, relevant portions of the U.S. Code, petitions to the Commissioner, and the decisions of Courts of Record. Commercial data bases may be accessed.

The workstation will be part of a "local" network to permit electronic mail, message center service, directory assistance, and other professional support services. Supervisors may have work routed to them electronically for review. This will contribute to efficiency and productivity by speeding review and coordination. Management will have immediate access to active application status and production data.

Once the application has been approved for issue or rejected, the normal patent examination phase is completed. The data bases will be updated to indicate final disposition of the application and released for post-examination processing.

The processing of international applications, under the Patent Cooperation Treaty (PCT), will be handled in a similar system with the possibility of electronic exchange with other countries, the World Intellectual Property Organization, and the international administrative body of the PCT.

Post-Examination



Photocomposition from Electronic File Wrapper

Automated Random Selection of Cases for Quality Review

Fee Processing

Archiving of Entire File Wrapper in Microform
- **Stored locally for rapid retrieval**
- **Permanent off-site storage**

Automatic Availability for Search

Copies Automatically Generated
- **Paper**
- **Microform**
- **Electronic**

Post-examination

Once the examination is completed, the approved application will be extracted automatically from the electronic data base and prepared for photocomposition. The final form will be reviewed and approved at a workstation. A random sample of cases will be automatically selected and docketed for quality review. Fee processing will be initiated.

The complete contents of all electronic file wrappers will be archived in a readily retrievable form. Abandoned applications will be flagged as owner proprietary. Following this process, patents will be made available for public search and subsequent dissemination to interested domestic organizations and foreign patent offices. If a new patent application cites an abandoned application, however, the abandoned patent will become public. It will be retrieved from the archives and entered in the searchable data bases.

Maintenance fee processing and status information on issued patents will be handled through the system, in addition to the re-examination of issued patents.

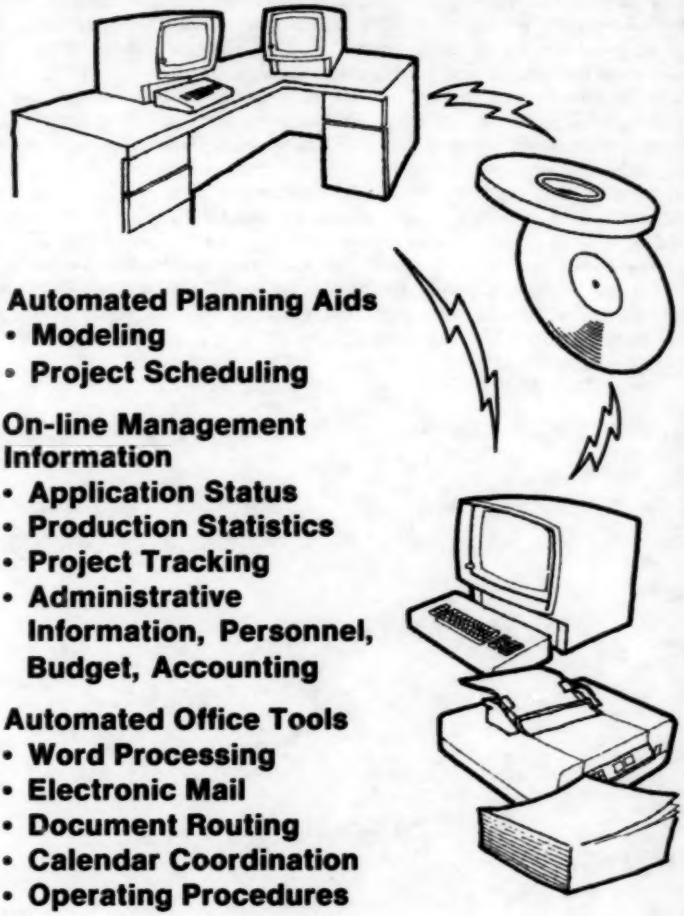
Trademark Operations

There are similarities in the functions which support the patent and trademark processes but also significant differences. Pending trademark applications are available to the public while pending patent applications are confidential. The same search files are used by trademark examiners and the public while there are separate patent search files for examiner and public use. Potential references can be identified for examiner evaluation with far less human intervention during the trademark search than is possible with patents. Although the searching function is simpler and does not require the number of iterations that patent searching does, the search techniques are equivalent. The first search can be accomplished with the system by matching search criteria to full or partial text and/or design mark attributes. The examiner will have options of searching with synonymous or phonic equivalents and/or of constructing more refined searches based on the results of previous searches.

The trademark registration procedure contains several steps that have no exact counterpart in patents. When an application is allowed by the examiner, it is published for opposition. The opposition period, in which the public can institute legal proceedings against registration of the mark, is thirty days. Thereafter, if no opposition is filed, the registration is issued. While trademarks are registered for twenty years, a mark will be cancelled if the registrant fails to file an affidavit of use by the sixth anniversary. When the affidavit of use is filed, the remainder of a twenty year cycle of legal rights is instituted. Thereafter, a registration may be renewed every twenty years as long as the mark continues to be used.

As has been described for patents, the future system will support most phases of trademark operations. The trademark data base will include text and images related to word and design marks. The design marks will be indexed to facilitate retrieval. An ownership data base will provide the chronology of ownership, including licenses. Also, data on application/registration status will be maintained. This will provide a complete history of the application/registration, including all communications between the applicant/owner and the Office. Data base access will be accomplished through electronic workstations using system capabilities similar to those discussed with reference to patents. Pre-examination, post-examination, and management functions also will be supported in a comparable manner.

Management



Automated Planning Aids
- **Modeling**
- **Project Scheduling**

On-line Management Information
- **Application Status**
- **Production Statistics**
- **Project Tracking**
- **Administrative Information, Personnel, Budget, Accounting**

Automated Office Tools
- **Word Processing**
- **Electronic Mail**
- **Document Routing**
- **Calendar Coordination**
- **Operating Procedures**

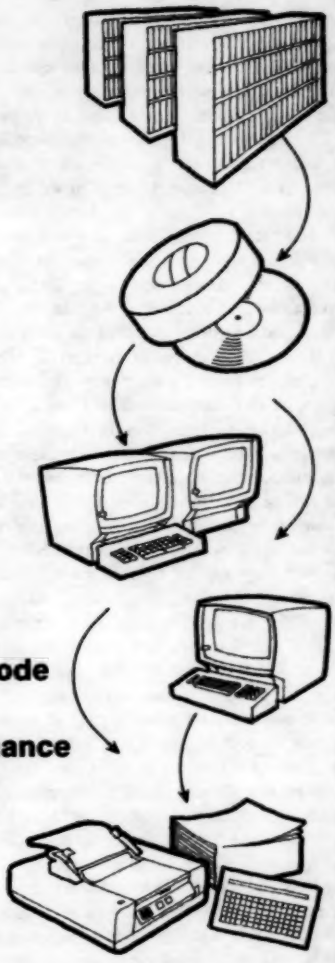
Management

The PTO management functions are typical of any large organization and include planning, directing, coordinating, and controlling. Planning is becoming an increasingly formalized effort to better control mission performance by continuously comparing actual to planned accomplishments. Management currently uses models to aid in planning and budgeting by projecting resource requirements needed to meet program goals. In the future, more sophisticated analytical models will be required to refine production estimates and schedules. More comprehensive activity tracking aids will be required to assist with program control. Model data will need to be linked directly to budget formulation, and planning systems, in turn, will need to be linked to accounting and budget execution.

In the future system, management will be supported by more complete and up-to-date management information. Automatic or semi-automatic activity and event recording, data base updating and management information reporting will be performed. Interactive terminals will allow immediate access to all management information. Status information may be compared to plans, variances high lighted, and summary electronic reports produced. Models will be available to allow the entire work process to be examined under hypothetical conditions as an aid to planning and decision making. Work products may be routed electronically for review and concurrence. Proposed plans on actions may be electronically coordinated. The system will provide electronic mail, document routing, project scheduling/tracking, calendar coordination, operating procedures retrieval, and other similar tools to support management functions.

System Requirements

- Paperless Operation
- Full Operational Support
- "User Friendly" Workstation
- Varied Data Base Access Techniques
- Applicant Selection of Communication Mode
- High System Performance Standards-Complete Redundancy



SYSTEM REQUIREMENTS

The concept of future PTO operations, briefly described in the preceding sections, requires a number of operational features that will determine the architecture of the system of the 1990's. The more significant of these are described below.

To achieve the proposed automated systems, it will be necessary to convert current and future files into electronic text and image data bases. Image data must be either stored electronically using optical or conventional magnetic disk technology, or stored as micro images and converted to electronic form at time of retrieval so that it can be transmitted to electronic workstations. Because of the size and costs of data base storage and retrieval, centralized master data bases will be necessary. The current files, which already would tax the capacity of available computer magnetic storage devices, are expanding continuously. High speed search—using a variety of techniques such as keywords, classification indexes, full text scanning—and high speed retrieval and transmission of electronic text and images will be necessary. Images will be closely scrutinized and, therefore, require high resolution storage and display.

The future system would support most functional operations of the PTO. This will require supporting a large number and variety of users—over 2,000 professional examiners and information specialists, administrative and clerical support personnel, managers and executives—within the PTO. The system would provide support for applicants, attorneys, and other users outside the PTO. Each user group will place different demands on the system, depending on the nature of its needs or work.

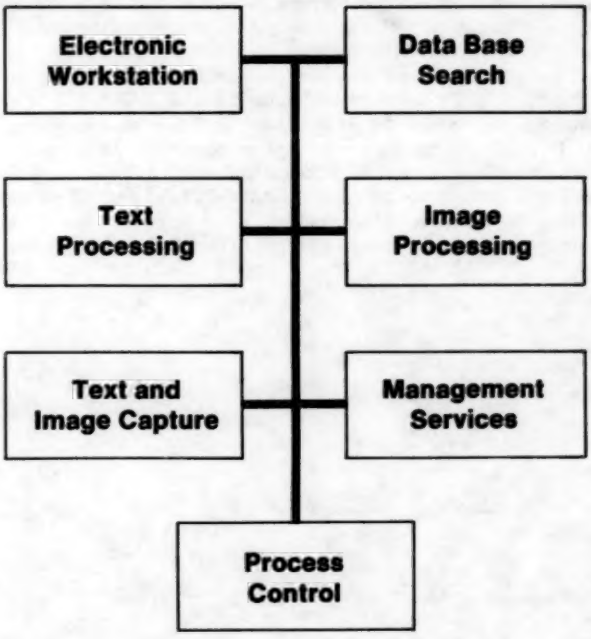
Uniformity and consistency in the method of workstation operation will be important to make the workstation easy to use by each group of users. However, workstation configurations that satisfy the unique display and control needs of each group will be necessary to keep their use simple and to minimize cost. For novice users, computer-aided instruction will be necessary to supplement menu-driven operating procedures. Some workstation configurations must include multiple displays which may be subdivided into multiple work areas for viewing, editing, or composing. A sufficient number of clearly labeled function keys will be required to minimize keystroking and to control workstation components. For more experienced users, an alternate command language will be needed to expedite task performance and minimize frustration caused by long, forced-use menu sequences. Uniform procedures and language for accessing and using all data bases, including commercial ones, will be required. To access commercial data bases, translation will be necessary for uniformity and user simplicity.

Applicants and other non-PTO users will be allowed to select the medium or mode of communicating or interacting with the system—either on paper, word-processing diskettes, or electronically from a terminal or another computer. This will require the capability to accept and process a variety of data formats and media and to produce a corresponding variety of outputs. PTO users will, likewise, have a choice of the output medium— electronic, paper, and/or microform.

System performance requirements will be extremely demanding. Response times for search, retrieval, and document scanning must be within the time frames set by current practice. Documents in a selected set must be simultaneously available, and the text and drawings simultaneously visible. Paging and document selection must match manual rates. An automated system is the only reasonable method of accomplishing PTO functions for the future.

System Development Approach

- Modular Architectural Concept
- Early Operating Capabilities
- Evolutionary Expansion & Enrichment
- Maximum use of Shelf Components
- Consistency in Interfaces



SYSTEM DEVELOPMENT APPROACH

Automated system capabilities required for future operations are extensive. Many are currently available off-the-shelf while others are just emerging. There is no single system available today, however, that will satisfy all requirements. With this in mind, the PTO has formulated the system development approach summarized below.

A preliminary technical concept of the system was formed by grouping capabilities into a small number of distinct, narrow-purpose categories. Existing technology and shelf components were matched with these categories to assess technical feasibility, to determine the magnitude of development still to be accomplished, and to develop preliminary schedule and cost estimates. While this assessment has established a technical concept, the architecture will undergo extensive refinement and extension during the next development phase.

A modular architecture is envisioned. The major components—the Electronic Workstation, User/Workstation Services, Data Base Search, Text Processing, Image Processing, Text and Image Capture, and Management Services—will be tied together by a Process Control and Network component. Each modular component will be developed or procured independently and integrated into the total system with minimal conflict. In addition, components may be replaced over time to take advantage of emerging technologies as they become commercially available and more cost effective, without disturbing other components.

In each component, a subset was identified for an initial operating capability to be achieved early in the system life cycle. Initial capabilities will be enriched and expanded during the second stage to establish an automated operation throughout the PTO. In the third stage, the system will be expanded to satisfy additional requirements and take advantage of technical and cost-beneficial opportunities. In this evolutionary approach, the technical objectives will be to establish component design features and interfaces and to retain maximum consistency in them throughout the life cycle. Off-the-shelf components will be used to the extent possible.

Life Cycle Strategy

- Life Cycle Framework
- Development and Data Base Standards
- System Integration Contractor
- Maximum Competition for Independent Components
- Maximum Flexibility in Business Arrangements
- Integrated Development, Transition, & Conversion Plan
- Management Framework

LIFE CYCLE STRATEGY

The future system will be developed within the framework of system life cycle guidelines adapted from Federal Information Processing Standards to meet the particular needs of this undertaking. In this framework, the life cycle is subdivided into distinct phases, each of which has associated certain activities, end-products, and decisions. This structure will give better visibility to and control by program and executive management. A conventional system development is planned. It can be developed and integrated using technology, products, and services that are commercially available and does not warrant the time and cost of design competition step.

Use of life cycle guidelines implies the use of documentation and other standards to assist in quality assurance. PTO will adopt standards and guidelines necessary to carry out a comprehensive quality assurance program. The quality assurance program will independently test and evaluate development work and products as they occur or become available. The program will be broadened to include data and data base standards which are necessary for design and for minimizing transition and conversion conflicts.

A systems engineering contractor will be selected to work with the PTO throughout the design and development phases of the life cycle, to complete the system architecture and design, and to perform the critical job of component integration. In addition, the systems contractor will perform necessary design trade-off studies, develop component design and acquisition specifications, and assist in procurement of necessary components and/or services.

All acquisition actions will conform to federal procurement regulations to achieve maximum practical competition for products or services. In addition, maximum flexibility in business arrangements, for government or private sector ownership and/or operation, will be allowed to satisfy the objectives of OMB Circular A-76. Acquisitions will be conducted through a formal source selection process in which a technical evaluation board will be chaired by the PTO; membership will include the systems engineering contractor. An advisory board will be chaired by the PTO with membership overlapping the membership of the automation coordinating committee and including Department of Commerce (DoC) representation. The contracting officer(s) will be appointed by DoC. The source selection authority will be a PTO official.

The PTO will rely largely on a systems engineering contractor and commercially available products and services. Internal PTO staff will be used only where it is most effective or mandatory. PTO activities will include overall direction and oversight of the entire development process, systems analysis where required, quality assurance, data base administration, and system design control. Internal staff will continue the development and evolution of the management services component and operation and maintenance of current automated systems. They also will perform and/or manage data base conversion activities.

The plan summarized here and presented in detail in the supporting documents encompasses all of the PTO's automated system activities, current system maintenance and operation, future system development, and all activities necessary to make the transition from current operations to the future system. Maintaining a single, integrated automation master plan will help management focus on the total program and resolve priority issues that will arise.

The management organization for carrying out the PTO automation program has been established. It is composed of an automation coordinating committee, which reports to the Commissioner of Patents and Trademarks consisting of management representatives from the patent and trademark programs as well as supporting staff offices. Direct program responsibility has been assigned to an Administrator for Automation who reports to the Assistant Commissioner for Finance and Planning. Full implementation authority, including monitoring of all automation resources, has been centralized under the Administrator for Automation to allow single point direction of the program.

System Implementation Milestones

Operating Capabilities

Stage 1	Stage 2	Stage 3
Patents: •Selected pre-examination processing •Single group examination processing •Selected post-examination processing •Selected Classification	**Patents and Trademarks:** •All pre-examination processing •All examination processing search •All post-examination processing •All Classification •Paperless search files—100% integrity •Pilot paperless Public Search Room	**Patents and Trademarks:** •Technology upgrades •Expanded public facilities •Expanded telecommunications •Extended dissemination support •Direct foreign data exchange
Trademarks: •All pre-examination processing •All examination processing •All post-examination processing		
Management: •Current systems	**Management:** •Fully integrated management information system	
1983-1984	**1985-1987**	**1988-1990**

SYSTEM IMPLEMENTATION MILESTONES

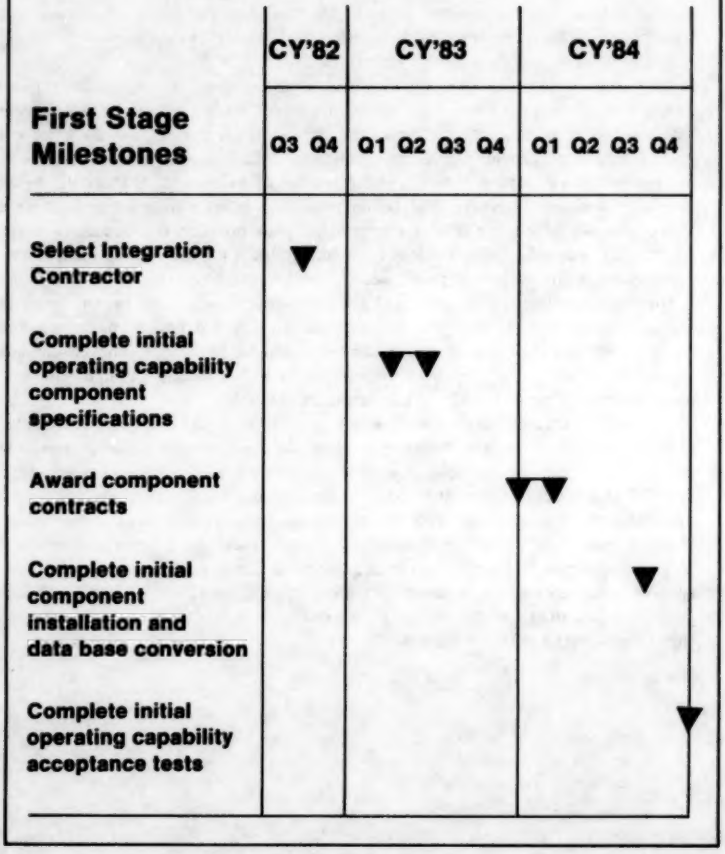
Under the current plan, the automation program would be attained in three stages. Initial operating capabilities, proposed to be implemented by the end of 1984, would include all basic components and necessary data bases. The Text and Image Capture component will accept and process data to be added to the electronic data bases. It is proposed that all data for both patent and trademark applications be converted to electronic and/or image form. Applications from Group 220, which is the first patent examining group selected for automation, and all of the trademark applications would be processed into the active data bases for use during this stage. A sub-set of the patent files and the entire trademark data base would be established. The Electronic Workstation and Workstation Services component would be implemented to allow each manager, examiner, and clerk to access the data bases using the Data Base Search components. This would be accomplished through a multi-purpose workstation for all first stage users. Finally, operational capabilities would include a local communications network. Current management information support systems would be maintained and modified as necessary to accommodate changes resulting from initial operational capabilities.

After successful completion of stage one, system capabilities would be expanded during the subsequent three-year stage to support most internal PTO operations. The capability to capture, process, and maintain all application papers for all groups would be provided. Pre-examination and examination would be based on an automated operation. Search and retrieval of existing U.S. patents, foreign patents, non-patent literature, and commercial data bases will be totally automated. Post-examination processing and the capability to produce the necessary outputs for printing would be fully developed and integrated with the Management Services component. A pilot paperless public search room would be established.

During stage three, the final technology upgrades would be incorporated into the automated system. The public search facilities would be expanded and direct worldwide system access and data exchange would be possible. Public dissemination capabilities would be expanded to include access to the system through telecommunications from Patent Depository Libraries, for example.

The initial stage of development, which is defined in more detail at this time, is critical to maintaining the long-range schedule. The more significant milestones during this stage are the selection of the systems engineering contractor, refinement of the system architecture, specification of the initial operating components, and subsequent acquisition and installation of those components. Since most of these milestones are affected by external factors, they also carry the greatest risk of schedule slippage. Except for the acquisition of the system engineering contractor support, other concurrent procurements are projected on 12 to 18 month schedules. While the schedule for the first stage is ambitious, it is possible to achieve it with the strategy that has been outlined.

Initial Operating Capability Implementation Schedule



COST ESTIMATES

Total automation program costs are estimated to be over $300 million during the next eight years. The first stage of the long range program will amount to about $30 million—for fiscal years 83 and 84. About half of the latter represents base systems costs—equipment and personnel—which would be incurred even if there were no improvements. The remainder is for new components and development services.

While program costs accumulate to a high level during the eight-year development, they will be balanced by improvements in the quality of PTO operations and by cost benefits. Base systems costs, without the improvements that have been planned, would amount to almost $60 million over this period if continued at the current rate of more than $7 million a year. Preparation of material for printing, which costs almost $15 million annually, will be accomplished using the system and will offset much of the program costs over the system life, projected to run through the 1990's. Patent copy sales, patent classification and documentation, and other dissemination functions will also be supported with similar offsetting cost benefits. Other cost benefits will derive from personnel and space cost reductions or avoidances. In addition to these tangible benefits, which should at least balance the costs over the system life, the benefits of data base integrity, timely examination, and much improved public access, will yield intangible benefits that will far outweigh the costs. Cost estimates for the developmental period are summarized in the accompanying table.

As operational capabilities are developed, they will enter the operation and maintenance phase. Cost estimates were projected to include both new acquisition and operation/maintenance costs.

Cost Estimates by Major Categories
(In millions, 1982 Dollars)

Category	Stage 1	Stage 2	Stage 3
Workstations and Workstation Services	2.5	36.6	96.1
Text and Image Capture	1.7	22.9	3.1
Data Base Processing	2.1	20.2	39.2
Management Service	2.8	19.2	22.9
Network and Process Control	1.1	4.6	6.3
Engineering/Systems Integration	3.9	6.0	1.5
Current Systems and PTO Staff	14.7	19.4	14.7
TOTAL	28.8	128.9	183.8
PTO Offsets	14.7	125.7	182.2
Net Program Costs	14.1	3.2	1.6

Additional systems operating personnel costs were not included on the assumption that any increase would be more than offset by other personnel cost savings that will accrue from the system. Developmental costs will peak during the third stage and drop to an operating level after stage three is completed. As may be seen, workstations and associated workstation services will cost more than any other category of expense because of the projected large number of users. Data base processing, including search, electronic text and image processing, represent the next highest cost. The cost of data capture peaks during the second stage. Management services and network related processing peak in the third stage, then drop to a constant operating level. Current systems will be supplanted by the end of stage two, resulting in a decrease in costs in that category. Systems engineering and technical support services are projected to terminate during the first year of stage three.

SUMMARY

The plan summarized in the preceding pages is aimed at fully automating the PTO operations by 1990. It is built around the concept of automating operations with electronic text and computer accessible image data bases. All current functions and processes will be performed using electronic workstations and other automated system components.

Automation will be accomplished in three stages. During the first stage basic operational capabilities will be provided to automate one patent group and all trademark functions. Pre-examination, post-examination, classification, and management support will be automated also. During the second stage, all patent groups will be automated. The third stage will provide for worldwide electronic access and expanded dissemination capabilities.

The plan embodies a management strategy that has proven successful in large programs of this magnitude. Capabilities will be implemented incrementally. Modular components will be acquired in parallel and integrated with minimal conflict and risk to overall program schedules. A systems engineering contractor will be used to complete the system architecture, specify components, and accomplish system integration. The management approach centralizes responsibility and authority for the program and provides executive direction and guidance through an automation coordinating committee.

The first phase of this plan, which has been set in motion, will satisfy the Patent and Trademark Office mission needs for improved operations through automation.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries, except the Cleveland Public Library, offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 25, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-06-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-31-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-15-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-30-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-13-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-20-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	1-09-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-05-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-26-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-20-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during December 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,221,339 to 3,226,728, inclusive

Plant Patents ..... Numbers 2,577 to 2,584 inclusive

REEXAMINATIONS

February 8, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,251,727 (52nd)
GAS DETECTION
David R. Piercy, Wareham, England, assignor to J. & S. Sieger Limited, Poole, England.
Reexamination Request No. 90/000,136, Jan. 11, 1982.
Reexamination Certificate for Patent No. 4,251,727, issued Feb. 17, 1981, Ser. No. 42,153, May 24, 1979
U.S. Cl. 250/343 Int. Cl.³ G01N 21/26

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–5, having been finally determined to be unpatentable, are cancelled.

Claims 6 and 7 are determined to be patentable as amended:

New claims 8–13 are added and determined to be patentable.

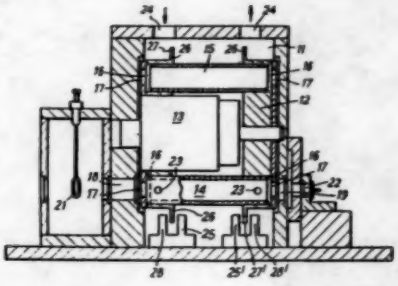
6. A process for detecting *and continuously monitoring* gases by absorption of infra-red radiation which comprises *the following steps:*

moving, in turn, at least two of a plurality of cells including at least one *enclosed* sample cell and at least one reference cell into [the] *an* optical path between a source of infra-red radiation and an infra-red detector so that infra-red radiation passes through the cell from said source to said detector [.];

comparing the infra-red radiation received by said detector when one of said at least two cells is positioned in said optical path electronically with the infra-red radition received by the detector when said at least one other cell is positioned in said optical path and producing a signal dependent on said comparison[, said cell being housed];

housing said cells in an enclosure into which an atmosphere to be tested is passed [.];

pumping said atmosphere *through apertures in said enclosed sample cell facing generally along the path of movement of the sample cell* [being pumped into at least one of said at least two cells] by the motion of



said *sample* cell through said enclosure from a position outside said optical path to a position in said optical path [.], *said cells having a length extending substantially along the entire optical path from said source of infra-red radiation to said infra-red detector;*

detecting and continuously monitoring said atmosphere pumped within said enclosed object sample cell.

REISSUES

FEBRUARY 8, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

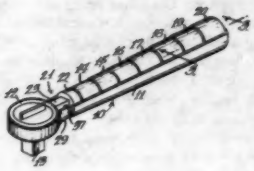
Re. 31,140
SOCKET WRENCH WITH INTERCHANGEABLE SOCKETS STORED IN HANDLE

Werner W. Martinmaas, 3461 Cashill Blvd., Reno, Nev. 89509

Original No. 4,253,356, dated Mar. 3, 1981, Ser. No. 73,966, Sep. 10, 1979. Continuation of Ser. No. 909,103, May 24, 1978, abandoned. Application for reissue Jul. 17, 1981, Ser. No. 284,382

Int. Cl.³ B25G *1/08*

U.S. Cl. 81—177 N — 30 Claims



26. Socket member storage means for a set of interchangeable sockets for a socket wrench of the type which has a head with a socket mounting stub, said storage means comprising:

a longitudinal wall defining a long, narrow cavity which has an entrance opening along one side, said cavity having several portions disposed therealong in tandem, each of which portions receives and separately retains one socket member of a set, and each portion of the cavity including means permitting the socket member in said portion to be removed therefrom through the entrance opening without disturbing any other socket member.

Re. 31,141
WINDOW SHADE, CURTAIN, OR DRAPERY ROD CORNER BRACKET

Bernard E. Bartels, 621 SE. 15th Ave., Apt. 101, Boynton Beach, Fla. 33435

Original No. 4,167,261, dated Sep. 11, 1979, Ser. No. 889,555, Apr. 17, 1978. Application for reissue Jan. 16, 1980, Ser. No. 114,792

Int. Cl.³ A47H *1/10*

U.S. Cl. 248—270 — 4 Claims

1. A [ribbed], self-positioning corner bracket eliminating measuring during mounting for use in mounting a window covering upon a mounting bracket, comprising:

a substantially planar inverted L-shaped mounting plate adapted to be secured on a surface near a corner of a window opening;

at least one laterally extending flange generally perpendicular to said mounting plate attached to an edge of said mounting plate for locating said mounting plate in the corner of said window opening precluding measuring of said mounting bracket; and

a plurality of preformed holes and adjusting slots in vertical and horizontal arrays in said mounting plate for receiving and locating a mounting bracket for a window covering.

Re. 31,142
ELECTRICAL TAB RECEPTACLE

Reginald J. Simmons, South Harrow, England, assignor to AMP Incorporated, Harrisburg, Pa.

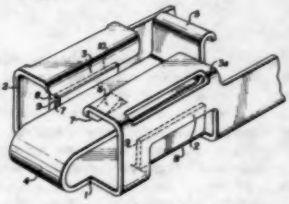
Reissued No. Re. 30,277, dated May 20, 1980, Ser. No. 876,584, Feb. 10, 1978.

Original No. 3,976,348, dated Aug. 24, 1976, Ser. No. 572,500, Apr. 28, 1975. Application for reissue Nov. 20, 1980, Ser. No. 208,714

Claims priority, application United Kingdom, May 3, 1974, 19542/74

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—74 R — 19 Claims



2. In combination, an electrical tab receptacle formed from sheet metal and comprising a generally channel-shaped receptacle portion having a base and upstanding side walls with free edge portions of the side walls turned in over the base for receiving a complementary tab between the base and the turned-in edges of the side walls, the base of the receptacle being formed with an outwardly and rearwardly directed lance, and an integral tongue extending from the base at the forward, tab-entry end of the receptacle portion, the tongue extending rearwardly in inclined manner towards the turned-in edges of the side walls, the free end of the tongue at the rearward end of the receptacle portion projecting rearwardly beyond the turned-in edges of the side walls, said tongue being turned outwards away from said base and projecting externally of said receptacle portion, and the tongue within the receptacle portion being formed in a middle portion with a lance inclined rearwardly from the tongue towards the turned-in edges of the side walls and arranged and adapted to engage a corresponding recess or aperture in a complementary tab when mated with the receptacle for latching the tab against withdrawal from the receptacle, and an insulating housing in which the receptacle is secured, a base of the housing being formed with a shoulder which is engaged by the lance on the base of the receptacle when the receptacle tends to move in one axial direction relative to the housing, and an upper wall of the housing being formed with a depending wall which prevents insertion of a complementary tab between the receptacle and the upper wall of the housing, and which is engaged by the turned-in edge portions of the side walls of the receptacle when the receptacle tends to move in the other axial direction relative to the housing, the upper wall of the housing being formed with a flexible portion which can be depressed to contact the free end of the tongue of the receptacle thereby to depress the tongue and release the lance on the tongue from a complementary tab mated with the receptacle.

Re. 31,143

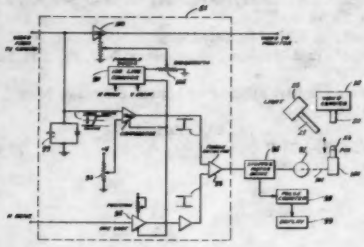
MEASUREMENT SYSTEM

Morton Kaye, deceased, late of Stamford, Conn., and by Sylvia Kaye, executrix, 122 Third St., Stamford, Conn. 06905

Original No. 4,113,389, dated Sep. 12, 1978, Ser. No. 678,059, Apr. 19, 1976. Application for reissue Jan. 28, 1980, Ser. No. 115,919

Int. Cl.³ G01B *11/06, 9/08, 11/30*

U.S. Cl. 356—381 **1 Claim**



9. [The system of claim **8**] *A system for determining a dimension of an object comprising means focusing an image in visible light and having a light dark transition on said object, means for optically scanning said image to produce a video signal, whereby an inflection occurs in a given line of said video signal at a time corresponding to said transition, means for adjusting the position of object until said inflection occurs at a reference point in said given line, and means for indicating the amount of said adjustment to determine said dimension, said means for optically scanning comprising a television camera, and said means for adjusting comprising micrometer means positioned to move said object along the optical axis of said television camera, said system* further comprising a source of a reference signal occurring at a determined time after the beginning of said given line, means comparing the phase of said reference signal with said inflection of said video signal to produce a control signal, and means responsive to said control signal for adjusting said micrometer means in a direction to reduce the time difference between said inflection and said reference signal.

Re. 31,144

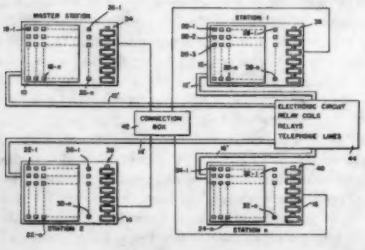
MULTI-STATION TELEPHONE SWITCHING SYSTEM

Thomas E. Feil, New York, N.Y., assignor to Interconnect Planning Corporation, New York, N.Y.

Original No. 3,991,282, dated Nov. 9, 1976, Ser. No. 536,838, Dec. 27, 1974. Application for reissue May 13, 1981, Ser. No. 263,208

Int. Cl.³ H04M *1/72*

U.S. Cl. 179—99 LS **9 Claims**



1. For a telephone system in which telephone communication is capable of being established for each telephone station of a plurality of telephone stations over a standard telephone line by directly connecting each telephone station to a selected standard telephone line of a plurality of standard telephone lines, each of said plurality of standard telephone lines capable of being directly connected to each of said plurality of telephone stations, an improvement comprising:

a plurality of pairs of contacts, with respective pairs of said contacts being connected with respective ones of said standard telephone lines for allowing said communication;

a plurality of relay coils, with respective ones of said relay coils controlling respective pairs of said contacts to be opened or closed;

a plurality of sets of *non-locking* pushbutton [switch means] *switches* with each set of pushbutton [switch means] *switches* connected to respective ones of said telephone stations with respective ones of said pushbutton [switch means] *switches* of said sets of pushbutton [switch means] *switches* corresponding to respective ones of said standard telephone lines and being connected with a respective ones of said relay coils and being depressed for energizing a selected one of said relay coils for closing a corresponding pair of contacts to allow said telephone communication; [and]

an electronic holding circuit for each of said relay coils, said holding circuits being operative

to establish a held state after initial energization of the associated relay coil by momentarily depressing the associated pushbutton switch, and

to maintain said corresponding pair of contacts closed while in the held state;

a logic circuit for each station connected to said holding circuits to detect conditions for releasing the held state;

each of said stations comprising [first light display means] *a set of status lights*, connection means connecting corresponding pushbuttons of said sets of pushbutton [switch means] *switches* in each of said stations and to said [first light display means] *status lights* for energizing said [first light display means] *status lights* in each station to display the status of each of said plurality of standard telephone lines in each of said stations,

said station further comprising [second light display means] *an active line indicator separate from said status lights* connected to said pushbutton [switch means] *switches* for identifying the standard telephone line *of said plurality of standard telephone lines* that the telephone station is using for said telephone communication.

Re. 31,145

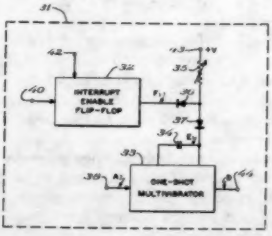
INTERRUPTABLE SIGNAL GENERATOR

Merlin D. Bjorke, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 4,262,222, dated Apr. 14, 1981, Ser. No. 968,534, Dec. 11, 1978. Application for reissue Jan. 6, 1982, Ser. No. 337,217

Int. Cl.³ H03K *17/28, 5/00*

U.S. Cl. 307—608 **6 Claims**



1. An interruptable signal generator comprising:

first means having an input connected to receive a trigger

signal and an output for generating an output signal which includes a timing cycle of a fixed known duration, the first means being responsive to the trigger signal for initiating the timing cycle, the output signal beginning in timed relation to the start pulse and terminating in timed relation to the end of the timing cycle; and

second means connected to the first means for *randomly* interrupting the timing cycle [for an indefinite period] *for up to an indefinite period*, the interruption [being] *beginning* in timed relation to an interrupt signal edge, and for reestablishing the timing cycle in timed relation to a reset signal edge, thus permitting the timing cycle to continue, the second means being connected to receive the interrupt and reset signal edges.

Re. 31,146

TWO-WIRE BALLAST FOR FLUORESCENT TUBE DIMMING

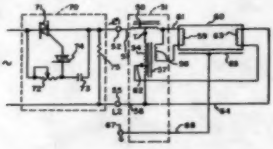
Zoltan L. Gyursanszky, Don Mills, Canada, assignor to Honeywell Ltd., Canada

Original No. 4,163,925, dated Aug. 7, 1979, Ser. No. 875,678, Feb. 6, 1978. Application for reissue Mar. 2, 1981, Ser. No. 239,709

Claims priority, application Canada, Apr. 21, 1977, 276641

Int. Cl.³ H05B *41/38, 41/20*

U.S. Cl. 315—276 **14 Claims**



1. A ballast for a fluorescent tube dimming arrangement comprising:

first and second terminals adapted to be connected to a source of variable power;

an inductive coil connected to said first terminal and adapted to be connected to a fluorescent tube; and,

a transformer having a primary winding, said primary winding having a first end connected to a tap on said inductive coil selected so that, as the power supplied to said fluorescent tube is varied for dimming, the voltage across said primary winding remains substantially constant, and a second end connected to said second terminal, said transformer further having first and second secondary windings for supplying filament voltage to said fluorescent tube.

Re. 31,147

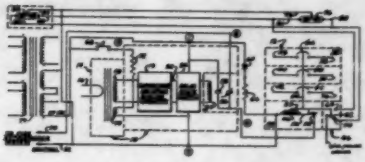
GROUND FAULT AND FIRE DETECTOR SYSTEM

William F. Helwig, Jr., Downers Grove, and Henry D. Jeffries, Jr., Naperville, both of Ill., assignors to Avtec Industries, Inc., Downers Grove, Ill.

Original No. 4,163,269, dated Jul. 31, 1979, Ser. No. 794,356, May 6, 1977. Application for reissue Jul. 31, 1981, Ser. No. 289,078

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—42 **10 Claims**



1. A ground fault and fire detector system for an A.C. electrical power distribution apparatus comprising:

circuit interrupter means having at least one pole for disconnecting an electrical load power supply from at least one load;

single-pole circuit means operatively connected to said interrupter means for controlling said interrupter means;

said single-pole means being operable to disconnect a power supply from a load upon being activated by separate sources of electrical power being imposed thereon in response to detection of a ground fault or detection of fire, respectively;

ground fault sensing means operatively positioned with respect to at least one wire for detecting a ground fault current;

said sensing means being interposed between the single-pole circuit means and a ground fault electrical power supply of less than 120 volts to control the power from the ground fault electrical power supply to the single-pole circuit means;

said sensing means including relay means responsive to detection of a ground fault current to electrically couple said ground fault power supply to the single-pole means for disconnecting said electrical load power supply from at least one load; and

said single-pole circuit means being further coupled to a fire extinguish system to supply power from a fire system electrical power supply [of at least 120 volts A.C.] to the single-pole circuit means for activating said interrupter means upon occurrence of a fire independently of said ground fault sensing means to disconnect said electrical load power supply from at least one load.

PLANT PATENTS

GRANTED FEBRUARY 8, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,980

PEACH TREE

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Aug. 13, 1981, Ser. No. 292,694

Int. Cl.[3] **A01H** *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by regular and good bearing of early ripening, medium size, semi-freestone, yellow-fleshed fruit having flesh of a very smooth and tight texture ripening quite evenly throughout the fruit in that the apex normally does not soften before the base of the fruit is ripe; and ripening about 6 days after the unpatented Springcrest peach tree.

4,981

CARNATION PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 10, 1981, Ser. No. 272,375

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct cultivar of *Dianthus caryophyllus,* L. known by the cultivar name Jack, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, twisting slightly with maturity; medium flower size, red flower color with minimum color oxidation; medium flowering response; 4 to 7 flowers and buds showing color per flowering stem; medium peduncle length; strong peduncle strength; and medium plant height.

PATENTS

GRANTED FEB. 8, 1983

ERRATA

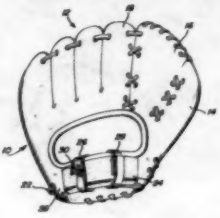
For CLASS	See PATENT NO.
297–047	4,372,041
114–244	4,372,359
494–016	4,372,483
494–014	4,372,484
384–094	4,372,624
384–129	4,372,625
384–129	4,372,626
384–260	4,372,627
436–537	4,372,745
436–066	4,372,746
436–067	4,372,747
436–073	4,372,748
376–417	4,372,817
436–176	4,372,874
260–453	4,372,877
548–468	4,372,887
377–008	4,373,135

PATENTS

GRANTED FEBRUARY 8, 1983

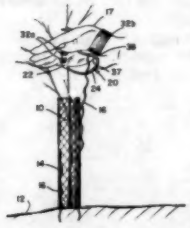
GENERAL AND MECHANICAL

4,371,983
WEIGHT ATTACHMENT FOR BASEBALL GLOVE
Joseph J. Piotti, Jr., 1625 Logan Ave., Rear, Altoona, Pa. 16602
Filed Dec. 31, 1980, Ser. No. 221,914
Int. Cl.³ A41D *13/08, 19/00*
U.S. Cl. 2—19 **7 Claims**



1. A baseball fielder's glove used during training to increase the strength, quickness and agility of a ball player's fielding hand through continued use, the baseball fielder's glove comprising a wrist strap included integrally with a back portion of said baseball fielder's glove for retaining the glove on the user's hand, a weight comprised of metal material, and fastener means securing the weight on the wrist strap, said fastener means including layer material at least partially encompassing the weight and the wrist strap.

4,371,984
PALM GUARD
Gary P. Fowler, Tennant Star Rte., Box 93, Macdoel, Calif. 96058
Filed Apr. 28, 1981, Ser. No. 258,411
Int. Cl.³ A41B *13/00*
U.S. Cl. 2—20 **7 Claims**

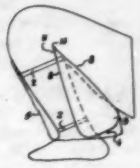


1. A palm guard for use in manually inserting a stake in the ground comprising a base, means for enabling said base to be held by a user's hand, and a rim secured to said base and forming therewith a pocket for receiving an end of the stake.

4,371,985
CONICAL BLADDER
Naum Pokhis, 1850 N. Whitley Ave., Apt. 317, Hollywood, Calif. 90028
Filed May 6, 1980, Ser. No. 147,110
Int. Cl.³ A41D *13/06*
U.S. Cl. 2—22 **7 Claims**

1. A device for facilitating squating and kneeling, comprising

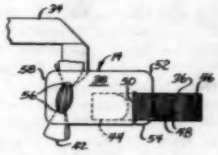
an inflatable bladder arranged to be located on a rear surface of a user's leg below a knee bend and movable between an operative position in which it is inflated and assumes a conical shape decreasing from a lower part of the user's leg to the leg bend in correspondence with a space between a user's calf and a user's thigh in squating or kneeling position so that a user's body is supported on thus



inflated bladder while squating or kneeling, and an inoperative position in which said bladder is also located in the same region but is deflated and assumes a substantially flat shape so as not to disturb the user; and

means for mounting said bladder in said region.

4,371,986
DISPOSABLE GARMENT
Cynthia A. Wichman, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Apr. 22, 1982, Ser. No. 370,871
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—051 **9 Claims**



1. A disposable garment, comprising:

a gown having a pair of sleeves, a front, and a pair of side margins defining an open back for the gown;

a first belt having one end secured to the gown and the other end being free;

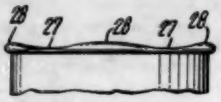
a second belt having one end secured to the gown; and

a transfer card having a slit, and means for releasably attaching the other end of the first belt to the card, with the card slit being received on the second belt to hold the card in place on the gown.

4,371,987
LATEX GLOVE
Bernard M. Brasfield, Arlington, Tex., assignor to Surgikos, Inc., Arlington, Tex.
Filed Mar. 12, 1980, Ser. No. 129,543
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—162 **3 Claims**

1. An elastomeric glove having a hand portion and a wrist portion, one end of the wrist portion having an opening in which the hand is inserted into the glove, a bead at the free open end of the wrist portion of the glove, the bead having a

plurality of densely rolled segments of elastomer around the circumference at the open end of the glove, each of the densely



rolled segments being separated from the next adjacent densely rolled segment by a loosely rolled segment of the bead.

4,371,988

GLOVES AND A METHOD OF MAKING THEREOF

Francis T. Berend, Boulogne-sur-Seine, France, assignor to Societe Anonyme Parinter, France

Division of Ser. No. 78,661, Sep. 24, 1979, Pat. No. 4,272,568, which is a continuation of Ser. No. 844,465, Oct. 1, 1977, abandoned. This application Oct. 14, 1980, Ser. No. 196,293

Claims priority, application France, Oct. 22, 1976, 76 31870

Int. Cl.³ A41D *19/00*

U.S. Cl. 2—167 **2 Claims**

1. A protective glove comprising, a flexible inner lining made of a fabric having externally thereon a flexible, protective two-layer coating based on plasticized polyvinyl, the coating being characterized by a first inner layer applied externally over the entire lining and having high mechanical and physical strength, a second outer layer bonded to the inner layer partly covering the inner layer and having a high resistance to chemical attack, the outer layer covering entirely only the backsides and frontsides of the five fingers of the glove and the palm thereof constituting gripping areas used for gripping articles, the backside of the glove being free of said outer layer, whereby the gripping areas simultaneously are flexible, have high mechanical and physical strength and are highly resistant to chemicals.

4,371,989

SEAMLESS CROTCH

Bernice Polsky, 139 N. Clark Dr., Beverly Hills, Calif. 90211

Filed Dec. 29, 1980, Ser. No. 221,318

Int. Cl.³ A41D *1/06*; A41B *9/04*

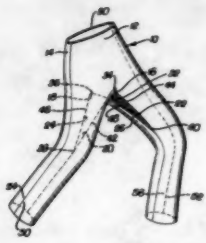
U.S. Cl. 2—227 **6 Claims**

1. A pants-like garment having leg portions and a trunk portion comprising:

a front piece having a trunk area and legs, the inside edges of said legs forming an inverted V and meeting said trunk area at a front piece crotch point;

a rear piece having a trunk area and legs, the inside edges of said legs forming an inverted V and meeting said trunk area at a rear piece crotch point; and

a generally diamond-shaped crotch piece having concave edges and made of a stretchable material, said crotch piece having a front and a back portion terminating in a first and second point opposite to each other, said first and second points defining a crotch axis, and having long tapering leg portions terminating in third and fourth points opposite to each other, said third and fourth points defining a longitudinal axis, said longitudinal axis being at least twice as long as said crotch axis and intersecting said crotch axis at a point closer to said first point than to said second point, said crotch piece being stretchable along said crotch axis, said first point being joined to said front piece at said front piece crotch point, said second point being joined to said rear piece at said rear piece crotch point, said edges of said crotch piece adjacent said first point each being joined to an inside edge of said legs of said front piece, said edges of said crotch piece adjacent said second point each being



joined to an inside edge of said legs of said rear piece, said inside edges of said legs of said front and rear pieces being joined together at said third and fourth points of said crotch piece and along their lengths to their bottoms, said front piece and said rear piece being joined together at the outside edges of said legs and trunk areas along their lengths, thereby forming a pants-like garment which conforms to the contours of the body in the trunk and upper leg areas, whereby said front and rear pieces cooperate with said crotch piece to pull said crotch piece away from the crotch area of a person when one leg of said person pulls on said garment.

4,371,990

THIGH PROSTHESIS

Lamberto Staffieri, 38069-Torbole sul Garda (Trento), Via Matteotti, 28, Italy

Continuation-in-part of Ser. No. 112,763, Jan. 17, 1980, Pat. No. 4,268,923. This application Jun. 16, 1980, Ser. No. 159,710

Claims priority, application Italy, Jan. 18, 1979, 82201 A/79

Int. Cl.³ A61F *1/04, 1/08*

U.S. Cl. 3—28 **10 Claims**

1. In a thigh prosthesis or artificial leg having a socket por-

tion designed to receive and be secured, in use, to an amputee's stump, a shin portion, and an articulation frame joining the socket portion to the shin portion, and resilient means for limiting and cushioning articulation movements of the said articulation frame, the improvement wherein the articulation frame is adapted sequentially to lengthen the prosthesis during an active deambulation phase and to shorten it during a passive deambulation phase and comprises yieldingly resisting means arranged to control extension and shortening movements of the said articulation frame.

4,371,991

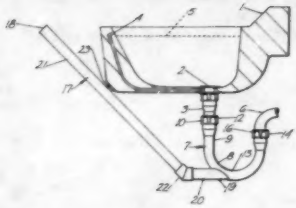
CLEAN-OUT TOOL FOR SINKS AND THE LIKE

Steve Schrott, 3269 Blue Rock Rd., Cincinnati, Ohio 45239

Filed Jul. 18, 1979, Ser. No. 58,515

Int. Cl.³ F16K 9/00

U.S. Cl. 4—255 **6 Claims**



1. In a tubular sink trap having a vertical leg section, means terminating the upper end of said leg section for connecting said trap to the lower end of a sink tail piece depending downwardly from a sink, an arcuate portion attached to the lower end of said leg section to form a generally U-shaped trap section, and means terminating the distal end of said arcuate portion for connecting said trap section to a waste drain outlet, the improvement in combination therewith comprising clean-out means for introducing a plumber's snake into said trap including a substantially straight tubular branch member extending horizontally outwardly from and positioned substantially co-axially with the lowermost part of said arcuate portion, an extension member comprising an upwardly extending tubular pipe having an open upper end configured to receive a plumber's snake, the lower end of the extension member extending substantially co-axially with said branch member, the extension member being dimensioned so that the upper end of the extension member extends at least to the overflow level of the sink, and means terminating the open end of said branch member for attaching the extension member thereto, the lower end of said extension member being slip-fitted within said branch member, the lower end of said extension member extending beyond said vertical leg section and containing an aperture in the upper wall of said lower end to permit flow of waste water from said vertical leg section to said arcuate portion.

4,371,992

WATER FEEDER CONSERVATION TANK

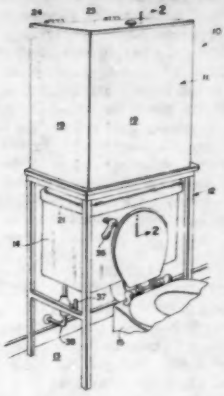
Alfredo Rivera, 1266 Olmstead Ave., Apt. 2-F, Bronx, N.Y. 10462

Filed Sep. 4, 1981, Ser. No. 299,598

Int. Cl.³ E03D 1/00

U.S. Cl. 4—353 **2 Claims**

1. A water feeder conservation tank, comprising, in combination, a tank member on a table and installed over a conventional toilet tank of a toilet, a drain pipe through a bottom wall of said tank member extending downward into said toilet tank, a hinged cover on a top of said tank member, an air-tight gasket between the edges of said cover and the edges of an opening in said tank member top and a float ball mechanism on a top of said drain pipe; said float ball mechanism being controlled by a chain attached to said hinged cover, a tension spring intercepting said chain, said float ball mechanism comprising a float ball receivable over a top opening of said drain pipe, said float ball being on one end of a rocker arm centrally pivotable about a stationary pin of a bracket installed upon said tank member



bottom wall while said chain is attached to an opposite end of said rocker arm so that said float ball is urged against said drain pipe by said spring when cover is upwardly pivoted, thereby preventing any water from entering said drain pipe while said cover is in an upwardly opened position.

4,371,993

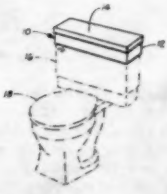
BIDET ALTERNATIVE APPARATUS

Billy J. Patrick, Rte. 2, Sulphur, Okla. 73086

Filed Jan. 29, 1981, Ser. No. 229,763

Int. Cl.³ A47K 3/22

U.S. Cl. 4—448 **2 Claims**



1. A hygiene apparatus comprising:

a portable housing, the housing having a first fluid chamber formed therein;

fluid routing means, disposed within the housing, for fluidly communicating with the first fluid chamber;

pump means, supported by the housing and in fluid communication with the fluid routing means, for pressurizing fluid received from the fluid routing means;

portable fluid delivery means, in fluid communication with the pump means, for dispensing pressurized fluid at a selected location, the housing is characterized as having a second fluid chamber formed therein; and

wherein the fluid routing means is characterized as fluidly communicating with the second fluid chamber and comprises:

manually controllable valve means, for selecting a selected one of the first and second fluid chambers with which the pump means fluidly communicates, in which the portable fluid delivery means is characterized as comprising:

a flexible conduit having an input end connected to the pump means, and having an output end;

a nozzle connected to the output end of the flexible conduit, the nozzle having a sprayer surface; and

an operator handle fixedly engaged with the nozzle, in which the nozzle is characterized as having a nozzle protection cap-engaging surface and as having a cleansing aperture formed in the nozzle protection cap-engaging surface, the apparatus further comprising:

a nozzle protection cap having an enclosing surface selectively disposable in overlying spaced-apart relation to the nozzle sprayer surface in a first installed position and in a second installed position, the nozzle protection cap characterized as permitting fluid existing the nozzle to drain from the nozzle by flowing through the cleansing aperture when the nozzle protection cap is in the first installed position, and as sealing the nozzle to prevent fluid flow through the cleansing aperture when the nozzle protection cap is in the second installed position.

4,371,994

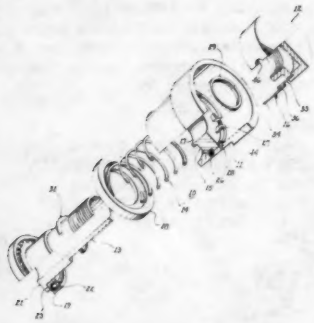
ROTATIONAL INDEXING NOZZLE ARRANGEMENT

Lester R. Mathews, 9810 N. 37th St., Phoenix, Ariz. 85028, assignor to Lester R. Mathews; Lucien Warner, both of Phoenix, Ariz. and Water Circulation Patents, Inc., Syracuse, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,042

Int. Cl.³ E04H *3/16, 3/18, 3/20*

U.S. Cl. 4—490 **11 Claims**



1. A rotational indexing nozzle arrangement adapted to be disposed in a conduit for supplying fluid under pressure comprising, a housing having a discharge end and being adapted to be disposed inside of such conduit, said housing including a support member having a central opening and two sides, a hollow stem having first and second ends slidably disposed in said central opening, a discharge head attached to said first end of said hollow stem adjacent the discharge end of said housing, abutment means at said second end of said hollow stem, first spring means between said abutment means and one side of said support member, and rotationally indexing means responsive to motion of said discharge head away from and toward said support member disposed between the other side of said support member and the under side of said discharge head for rotating said discharge head a predetermined amount upon each movement cycle of said discharge head.

4,371,995

RECREATIONAL BASIN

William H. Donhauser, 1128 Amador Ave., Berkeley, Calif. 94707

Filed Mar. 9, 1981, Ser. No. 241,479

Int. Cl.³ A47K *3/02*

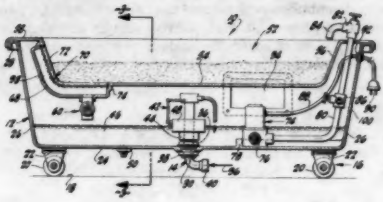
U.S. Cl. 4—538 **9 Claims**

1. A recreational basin holding solids and fluid comprising:

a. a tub having a fluid inlet thereto;

b. a pan superposed in relation to said tub, said pan including means for draining fluid therefrom to said tub;

c. means for pumping fluids from said tub to said pan, said pumping means having a fluid inlet in said tub;



d. means for screening solids from the fluid draining from said pan to said tub;

e. means for regulating the level of fluid in said tub.

4,371,996

ARTICULATED BED

Sylvain Nahum, 16 avenue Dumas, 1206 Geneva, Switzerland

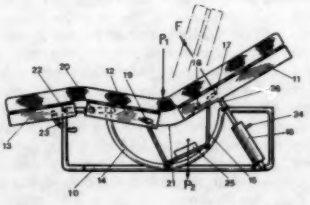
PCT No. PCT/CH80/00010, § 371 Date Jan. 2, 1981, § 102(e) Date Jan. 2, 1981, PCT Pub. No. WO80/01979, PCT Pub. Date Oct. 2, 1980

PCT Filed Jan. 31, 1980, Ser. No. 229,590

Claims priority, application Switzerland, Aug. 11, 1979, 7332/79

Int. Cl.³ A61G *7/00*

U.S. Cl. 5—69 **9 Claims**

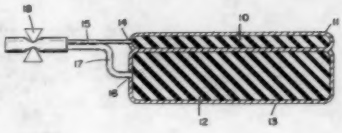


1. Articulated bed comprising: a bed frame including a cradle integral thereto; a mattress-holder including a back-rest and a separate seat-rest; a carrier and means mounting said carrier on said cradle for rocking motion of said carrier along said cradle; means mounting said back-rest on said carrier for rotation about an axis transverse of said back-rest intermediate the ends thereof; means mounting one end of said seat-rest on said carrier for rotation about an axis transverse of said seat-rest and further means mounting the other end of said seat-rest on said frame for rotation about a further axis transverse of said seat-rest; means to cause rocking of said carrier on said cradle, and means articulating adjacent ends of said back and seat-rests to one another, whereby when said carrier is rocked, along said cradle, said back-rest and seat-rest are inclined in opposite directions.

4,371,997
ADJUSTABLE FIRMNESS CUSHION WITH MULTIPLE LAYERED FOAM-FILLED COMPARTMENTS

Roy D. Mattson, 2194 Deer Pass Trail, White Bear Lake, Minn. 55110

Filed Aug. 25, 1980, Ser. No. 181,166
Int. Cl.³ A47C 27/10, 27/18
U.S. Cl. 5—450 6 Claims



1. Cushion comprising:

at least two layers of flexible urethane foam, each layer substantially hermetically sealed in its own compartment by a surrounding thin sheet of flexible material the foam substantially filling each compartment;

one layer substantially overlaying another;

an air port for each of said compartments;

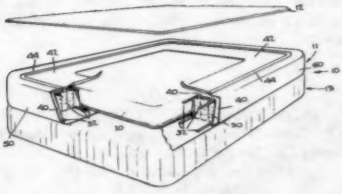
a tube connected at one end to each port and open to atmosphere at its other end; and

a manually operable valve coupled to said tubes for selectively opening or closing off the tubes.

4,371,998
HYBRID FLOTATION MATTRESS HAVING PROTECTING, WATER PROOF LINER

Milton A. Callaway, Medford, Oreg., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Dec. 31, 1980, Ser. No. 221,876
Int. Cl.³ A47C 27/08
U.S. Cl. 5—451 1 Claim



1. A hybrid flotation mattress comprising:

a perimeter of resilient bedding material defining a central cavity;

a water bag positioned within said central cavity;

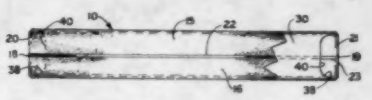
a first protective liner extending over said perimeter of resilient bedding material, between said perimeter and said water bag, and underlying said water bag;

a second protective liner enveloping said perimeter, said water bag, and said first protective liner, a portion of said second protective liner extending over the peripheral portions of said water bag and defining an opening allowing access to said water bag, said second protective liner being sealed to said first protective liner above said perimeter of resilient bedding material thereby preventing any leakage from said water bag from reaching said perimeter.

4,371,999
AIR MATTRESSES

Keith Reid, 2082 Zanker Rd., San Jose, Calif. 95131

Filed Nov. 18, 1980, Ser. No. 208,079
Int. Cl.³ A47C 27/08
U.S. Cl. 5—457 4 Claims

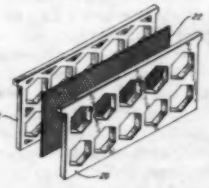


1. In an air mattress having top and bottom walls that are connected by a plurality of longitudinally-extending partitions which extend from adjacent one end wall of the mattress to a point adjacent the other end wall of the mattress and are secured to the top and bottom walls by seams that connect longitudinal flanges along each edge of each partition to the adjacent top or bottom wall, the improvement which comprises means defining a recess in each end of each partition to provide a pair of spaced flange portions adapted to be bent along the adjacent end wall of the mattress with its end portions secured to the end wall.

4,372,000
BEEHIVE FRAME AND METHOD OF CONSTRUCTION THEREOF

Edford N. Hurd, R.D. 1, Pennellville, N.Y. 13132

Filed Feb. 9, 1981, Ser. No. 232,471
Int. Cl.³ A01K 47/02
U.S. Cl. 6—10 8 Claims



1. The method of constructing a disposable, single use honeycomb frame comprising:

(a) forming a unitary, molded, light weight, easily cuttable plastic member having a plurality of openings extending therethrough and surrounded on all sides by structure of predetermined thickness;

(b) cutting said member lengthwise into two pieces of approximately half said predetermined thickness, whereby each piece has a plurality of separated openings therethrough;

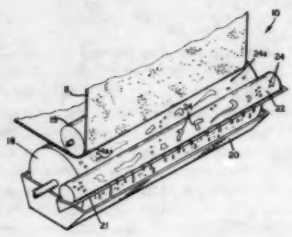
(c) placing a sheet of comb foundation at least as large as the total area of said openings between said two pieces; and

(d) joining said two pieces to one another with the openings in registration and said sheet covering the inside of each, whereby said frame may be placed in a super for construction of combs and deposit of honey within the openings on each side of said comb foundation and any desired portion of said frame including one or more of the honey-containing openings may be severed from the remainder of said frame.

4,372,001
CARPET DYEING SYSTEM WITH MOVABLE SQUEEGEE ROLL

H. Armin Maier, Calhoun, Ga., assignor to Gowin-Card, Inc. and Tuftco Corporation, both of Chattanooga, Tenn.

Filed Mar. 12, 1981, Ser. No. 243,087
Int. Cl.³ D06B 1/14, 11/00
U.S. Cl. 8—151 9 Claims



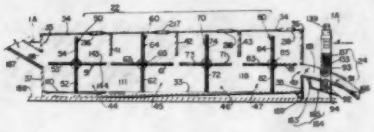
1. A process of dyeing carpet with a pile surface comprising moving the carpet along its length with its pile surface facing downwardly, and as the carpet is moved along its length contacting the downwardly facing pile surface of the carpet with the upper surface of a dye pickup roll, rotating the dye pickup roll so that its upper surface progressively moves into contact with the carpet, applying dye to the lower surface of said dye pickup roll, engaging the dye pickup roll at a position after dye has been applied thereto and before the dye pickup roll contacts the carpet with a squeegee roll which is longer than the surface of the pickup roll that contacts the carpet and which defines a pattern of high and low surfaces spaced about its circumference, rotating the squeegee roll so that the surface of the squeegee roll that engages the surface of the dye pickup roll moves in the same direction as the adjacent surface of the dye pickup roll and its high surfaces remove some of the dye from the surface of the dye pickup roll and the dye applied by the pickup roll to the carpet is formed in a pattern that corresponds to the high and low surfaces of the squeegee roll, and reciprocating the squeegee roll at an amplitude such that the pattern of high and low surfaces of the squeegee roll continues to be applied to the pickup roll and to the carpet but the pattern of dye applied to the pickup roll and to the carpet is displaced along the length of the pickup roll and across the length of the carpet.

4. Apparatus for applying dye to the pile surface of carpet and the like comprising a dye pickup roll, means for applying liquid dye to said pickup roll, means for rotating said pickup roll, means for moving carpet along its length and for moving the pile surface of the carpet into contact with said dye pickup roll and in the direction of movement of the dye pickup roll, a squeegee roll extending parallel to and in contact with said dye pickup roll at a position in the direction of rotation of said dye pickup roll between the position where dye is applied to the pickup roll and where the pickup roll contacts the pile surface of the carpet, means for rotating and reciprocating said squeegee roll, said squeegee roll having a cylindrical surface with a plurality of depressions therein spaced about the circumference of the squeegee roll, whereby the surface of the squeegee roll that contacts the pickup roll tends to remove the liquid dye from the surface of the pickup roll and the depressions of the squeegee roll create a pattern in the dye on the dye pickup roll and the pattern of dye is carried by the dye pickup roll to the pile of the carpet.

4,372,002
COTTON TREATING PROCESS

Eugene D. Small, 1302 La Paloma St., Amarillo, Tex. 79106

PCT No. PCT/US80/01387, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO82/01567, PCT Pub. Date May 13, 1982
PCT Filed Oct. 17, 1980, Ser. No. 251,531
Int. Cl.³ D06B 3/02
U.S. Cl. 8—156 8 Claims



1. A process of impregnating loose cotton staple and like hollow fibers with chemicals comprising the steps of

feeding a mass of such fibers into and through a series of connected compartments in a baffled housing,

one pair of paddle assemblies, each said paddle assemblies being rotatable about an axle therefor, and each of said paddle assemblies comprising a plurality of paddles, located in each of said compartments and a body of chemical-containing aqueous liquor being also located in each of said compartments, said liquor at rest being located entirely below the level of the axles of said paddle assemblies,

rapidly rotating said paddle assemblies in opposite directions while in contact with said body of liquor and then thereby concurrently

(a) initially producing within each of the said compartments a vertically extending column comprising a frothy mass of bubbles of air separated by thin walls between said bubbles and locating such fibers in said thin walls between the bubbles of said column,

(b) picking up portions of the frothy mass of fibers and liquor from the mass of bubbles and positioning the fibers in thin films of chemical-bearing liquor on the surfaces of said paddles above the level of the axles of said paddle assemblies,

(c) dewatering the resulting thin films, and

(d) kneading the fibers individually and locating chemicals contained in said liquor within the lumen of each of such fibers.

4,372,003
INDUSTRIAL PIPE THREAD CLEANER

Lester W. Toelke, Houston, Tex., assignor to International Tool & Supply Co., Inc., Houston, Tex.

Filed Jun. 10, 1980, Ser. No. 158,342
Int. Cl.³ B08B 9/02
U.S. Cl. 15—88 9 Claims

1. A powered thread cleaner especially adapted for cleaning threads of industrial tubulars, comprising:

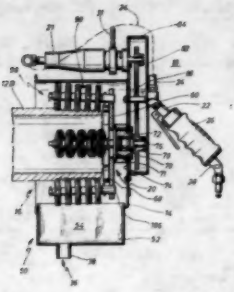
(a) a housing having an end for receiving the threaded member to be cleaned;

(b) a brush support structure rotatably supported and driven within said housing;

(c) a set of brushes supported around the periphery of said brush support structure, said brush support structure having an irregularly shaped perimeter defining a plurality of perimeter portions extending from a central portion, said perimeter portions having means for adjustably securing a respective brush in a selected orientation with respect to the threads to be cleaned, and

(d) and set of brushes including one or more brush assemblies having (i) a shaped mandril upstanding from the

brush support member and (ii) a plurality of relatively thin circular brushes spaced from one another on said mandril



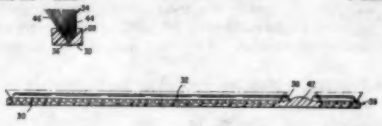
and mounted on said mandril in an adjustably fixed orientation with respect thereto.

4,372,004

WIDE-SWEEP CARPET CLEANER BRISTLE STRIP AND BRUSH ROLL

Don W. Vermillion, Anderson, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 3, 1981, Ser. No. 250,795
Int. Cl.³ A46B 9/02, 13/02
U.S. Cl. 15—182 4 Claims



1. In a brush or agitator roll of a suction cleaner for carpets or other floor coverings provided with at least a pair of diametrically opposed longitudinally extending spiral grooves and a bristle/agitator strip spirally, slidably engaged in each spiral groove, the improvement wherein each strip has a section including a band forming part of a crowned pulley for a drive belt and on either side thereof being provided with a series of holes for receiving bristle tufts wherein, on each side, the strip is provided with a radial hole at a medial location with each succeeding bristle hole being elongated so that its inner wall is radial and the outer wall is inclined away from the center by an amount equal to the inclination of the adjacent hole plus a fixed incremental amount so that although the inner edge of each hole is generally upright or radial, the outside edges are successively angled outwardly so that the holes can be molded utilizing a single core strip and the bristle tufts can be inserted and stapled radially, together with bristle tufts stapled therein having substantial bristles angled outwardly so as to provide a brush having a line of bristles effectively longer than the supporting strip.

4,372,005

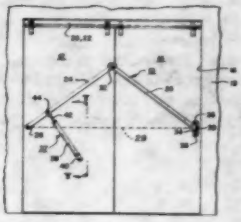
OPERATOR FOR SLIDING DOORS

Richard X. Incisso, 6420 Adelphia St., Pittsburgh, Pa. 15206

Filed Aug. 4, 1980, Ser. No. 175,178
Int. Cl.³ E05F 3/10, 17/00
U.S. Cl. 16—52 7 Claims

1. A closure for closing a pair of sliding doors that are adapted to overlap each other at least partially when the doors are opened comprising:

a pivoting link including a first link member pivotally mounted to a said door and a second member pivotally attached to said first link member and to the remaining said door, the point of attachment of said first member to said second member being offset from a line connecting the respective points at which said members are mounted to said doors, said point so attachment not being in alignment with said mounting points at anytime during normal operation of said closure, said closure causing said doors to close by moving at least a said door in a direction that



causes said doors to overlap each other progressively less by causing said point of attachment to move toward said connecting line; and

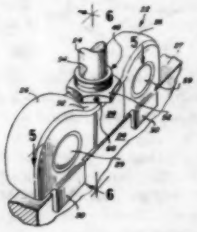
biasing means operatively connected between one said door and the said member mounted to that said one door for pivoting said point of attachment toward said connecting line to close said doors.

4,372,006

FREIGHT DOOR ROLLER HOUSING

Peter J. Stratta, Olympia Fields; John G. Stratta, Orland Park, and Douglas M. Camp, Midlothian, all of Ill., assignors to Harbor Tool Mfg. Inc., Chicago, Ill.

Filed Oct. 17, 1979, Ser. No. 85,609
Int. Cl.³ E05D 17/00
U.S. Cl. 16—105 15 Claims



1. A roller assembly for use with the plug door of a railroad freight car in which the door has a vertically arranged support pin adapted to be pivotally connected with said roller assembly and having a cylindrical bottom end, said assembly comprising:

A. a pair of wheel wells each having a roller journalled therein, the wells being hollow and opening to their bottoms and the rollers having their bottom segments protruding from the said bottom openings and adapted to ride upon a rail of the said freight car and the wheel wells having means for guiding the assembly as it rides said rail;

B. a center block connecting the wells and forming therewith an integral structure, the block having an upper side,

C. a central vertical cylindrical passageway through the block; and

D. a bushing of generally thimble-shaped construction, having a central socket with a blind bottom end, the socket adapted to receive the bottom end of of a support pin therein in pivotal engagement, said bushing having a slide

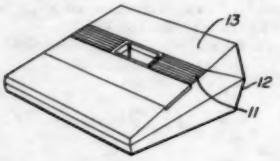
fit engagement with said passageway and being inserted therein from the top end thereof, said bushing having means adjacent the upper end thereof cooperating with said upper side for retaining the bushing in position within said passageway against movement through the passageway downward but being free to be pushed upward and out of the passageway from the bottom end of the passageway, the bushing being plain on its exterior and being retained in a single vertical location within said passageway, and an annular counterbore in the upper end of the passageway larger in diameter than the passageway and forming an annular shoulder adjacent said upper end and said bushing including a flange seated on said shoulder in said counterbore, said counterbore, shoulder and flange comprising said retaining means.

4,372,007

RELEASEABLE HINGE MECHANISM

Hugh Lee, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 8, 1981, Ser. No. 223,649
Int. Cl.³ E05D *11/10*
U.S. Cl. 16—260 **6 Claims**



1. In combination, a releaseable hinge mechanism, a cover member and a base member having a deflectable support wall and a facing margin adjacent said support wall, said mechanism comprising:

a hinge connected to said cover member, said hinge including a central elongate portion having a flatted distal end and a pair of pivot pin portions flanking said distal end, said distal end including a pressure finger extending outwardly from the top edge;

a pair of cradle members located on said support wall for releaseably receiving said pivot pin portion; and

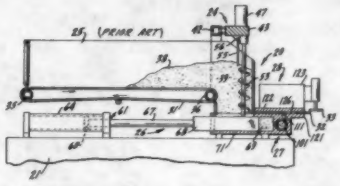
compound bracket means located on said facing margin, said bracket means including a spaced pair of relatively inflexible brace portions in facing relation with said flatted distal end and normally engaged in surface contact therewith when said cover member is in an opened position, said bracket means further including a deflectable finger portion located between said pair of brace portions and arranged for surface contact with said pressure finger when said cover member is moved between a closed position and said opened position, said bracket means further including a spaced pair of retaining fingers extending over said distal end of said hinge to restrict movement of said pivot pin portions away from said cradle members, whereby overtravel of said cover member past said opened position causes the lower edge of said flatted distal end to engage said brace portions and progressively deflect said support wall away from said facing margin until said distal end is released from said retaining fingers.

4,372,008

FOOD PATTY MOLDING MACHINE WITH MULTI-ORIFICE FILL PASSAGE AND STRIPPER PLATE

Glenn A. Sandberg, Lockport, Ill., assignor to Formax, Inc., Mokena, Ill.

Continuation-in-part of Ser. No. 204,840, Nov. 7, 1980. This application Apr. 23, 1981, Ser. No. 256,797
Int. Cl.³ A22C *7/00*
U.S. Cl. 17—32 **5 Claims**



1. In a food patty molding machine of the kind comprising:

a mold plate having at least one mold cavity of given surface area formed therein;

mold plate drive means for driving the mold plate, in a repeating cycle, from a fill position to a discharge position and back to the fill position;

a food pump for pumping a moldable food product;

a fill passage extending from the outlet of the food pump to the mold plate and connecting the food pump outlet to the mold cavity when the mold plate is in its fill position, the fill passage having a cross-sectional area, immediately adjacent to the mold plate fill position, effectively encompassing substantially the entire surface area of the mold cavity;

and an orifice plate, interposed in the fill passage immediately adjacent the mold plate, including a multiplicity of fill orifices distributed throughout substantially the entire surface area of the mold cavity;

the improvement comprising:

the fill orifices being aligned in parallel rows with equal center-to-center spacing between the orifices in the direction of the rows;

a stripper plate slidably mounted in the fill passage immediately adjacent the side of the orifice plate opposite the mold plate, the stripper plate including a multiplicity of fill openings aligned one-for-one with the fill orifices as extensions thereof;

and stripper plate drive means, synchronized with the mold plate drive means, for sliding the stripper plate through a distance approximately equal to the center-to-center spacing of the orifices once in each mold plate cycle.

4,372,009

SUPPORT SHACKLE AND PRODUCT DROP MECHANISM

Richard D. Linville, P.O. Box 7, Pleasant Valley, Iowa 52767

Filed Jan. 21, 1981, Ser. No. 227,140
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—44.1 **2 Claims**

1. A shackle for hanging a product from a conveyor, comprising:

a single, rigid, elongated bar,

an apertured plate member means at one end of said bar for pivotably suspending said shackle from said conveyor,

support means extending laterally from the other end of said bar for holding said product,

striker means mounted adjacent to said bar for abruptly striking said bar to release said product carried by said support means,

said conveyor including a depending pendant member from which said apertured plate member is suspended, and

means for preventing said apertured plate member from twisting,

said last mentioned means including a notch in one of said members, the other of said members being disposed in said notch.

4,372,010

APPARATUS FOR THE AUTOMATIC INFEED OF A TEXTILE FIBRE SHEET INTO A COILER

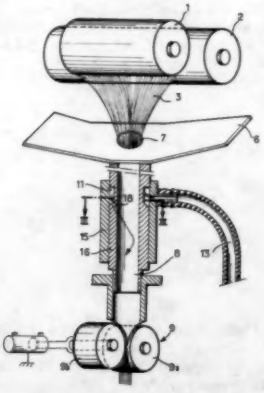
Roger Gauvain, Buhl, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

Filed Sep. 17, 1980, Ser. No. 188,077

Claims priority, application France, Sep. 28, 1979, 79 24188

Int. Cl.³ D04H *11/00*; D01H *5/72*

U.S. Cl. 19—159 R **2 Claims**



1. Apparatus for the automatic infeed of a textile fibre sheet into a coiler, for example at the delivery side of a drafting machine, comprising a smooth-surfaced transverse guide to be placed at the delivery side of a pair of drawing rollers and having an orifice for gathering into a tuft the fibre sheet coming from said pair of rollers, a cylindrical outlet tube extending from said gathering orifice, pneumatic means coupled to said cylindrical outlet for inducing a suction of air therein and drawing the tuft into the outlet tube, and a pair of final draw rolls set at the downstream end of the outlet tube, said final rolls being positioned in their normal working made in a closed position to close substantially said downstream end for mechanically drawing the tuft through said rolls, and one of said final rolls being temporarily movable to a separated position apart from the other roll to open said downstream end and to cause said pneumatic means to induce a suction of air through said tube to drive the leading end of the tuft through said rolls.

4,372,011

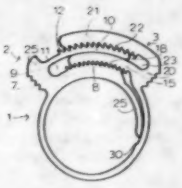
FLEXIBLE BAND CLAMP

Nereo Aranyos, 1073 Dominion Rd., Auckland, New Zealand

Filed Jan. 27, 1981, Ser. No. 228,738

Int. Cl.³ B65D *63/10*

U.S. Cl. 24—20 TT **4 Claims**



1. A clip including a band formed of a suitable material, rib formations being provided at both ends of the band and the rib formations each comprising a plurality of teeth; a first end of the band being formed with a lower rib and an upper rib being spaced apart from and above said lower rib, the teeth of the lower rib at the first end of the band extending upwardly and a recess being formed between the upwardly extending teeth and the upper spaced apart rib at the first end of said band; an upper surface of said upper rib being formed or provided with a plurality of teeth; the rib formation at a second end of the band being in the form of at least a base end rib, being formed on its lower face with a plurality of downwardly extending teeth; a spaced apart and overhanging rib being provided above the base end rib and being provided with downwardly extending teeth on its lower surface; a recess being formed between the upper surface of the base end rib and the teeth on the lower surface of the upper spaced apart overhanging rib; the arrangement being such that the ends of the band are brought together and the base end rib and downwardly extending teeth thereof of the second end are received and located within the recess formed between the upwardly extending teeth of the lower rib of the first end of the band and the upper rib at the first end of the band; the said upper rib in the first end of the band passing into the recess formed between the base end rib of the second end of the band and the upper overhanging rib of the second end of the band; the teeth in the upper rib at the first end of the band and the teeth in the upper overhanging rib at the second end of the band engaging one with the other so that the ends of the band are engaged one with the other.

4,372,012

BELT ADJUSTING DEVICE FOR A SAFETY BELT

Artur Föhl, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,475

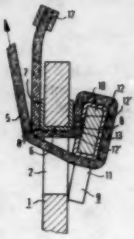
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905832

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—68 R **13 Claims**

2. Belt adjusting device for a safety belt, comprising a sliding member having a slot formed therein bordered by edges of said sliding member through which a portion of the safety belt is pulled forming a loop, and a locking-bar at least partly disposed within the belt loop, said locking-bar being slideable transversely to said slot and having a groove formed therein

extending parallel to said slot, when a load is applied to the belt, said groove formed in said locking-bar is aligned opposite one of said edges of sliding member bordering said slot, and the belt is pressed between said groove formed in said locking-bar



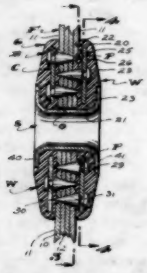
and said one edge of said sliding member, said locking-bar including a sheathing partly surrounding said locking bar in a given direction, said sheathing having parallel end edges being spaced apart from each other forming the width of said groove.

4,372,013

GROMMET

Charlie V. Gautier, Jr., 110 The Village #502, Redondo Beach, Calif. 90277

Filed Jul. 27, 1981, Ser. No. 287,310
Int. Cl.³ A43C 5/00
U.S. Cl. 24—144 8 Claims



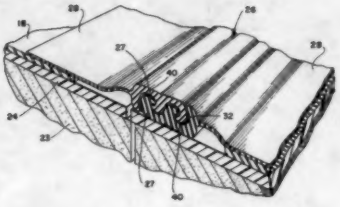
1. A grommet comprising a pair of annular washers with flat opposing axially disposed inner surfaces engaged with axially outwardly disposed outer surfaces on a multi-laminate fabric structure and concentric with and about an opening in said structure, an elongate coupling sleeve concentric with and engaged through said opening and through said washers and having radially outwardly flared opposite end portions engaging axially outwardly disposed outside surfaces on said washers and holding said washers and fabric structure in tight assembled relationship, said washers have annular plastic inner portions engaged with said outer surfaces of the fabric structure, flat annular metal portions outward of said plastic inner portions and a plurality of circumferentially and radially spaced inwardly convergent metal projections projecting axially inwardly from the annular metal portion of each washer through the inner plastic portion thereof, through said fabric structure and penetrating the plastic portion of the other washer.

4,372,014

CONSTRUCTION SYSTEM AND FASTENER THEREFORE

Harold G. Simpson, Oklahoma City, Okla., assignor to Star Manufacturing Co., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 445,498, Feb. 25, 1974, Pat. No. 3,935,682. This application Dec. 31, 1975, Ser. No. 645,601
The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.
Int. Cl.³ A44B 19/14
U.S. Cl. 24—201 C 16 Claims



1. A fastener adapted to be disposed along an edge of a member in a construction system including a plurality of such members arranged side by side, said fastener comprising, in combination:

a fastener body including coupling means for cooperative fastening relationship with a fastener along an adjacent member;

means for providing connection between said fastener body and the member on which it is to be disposed; and

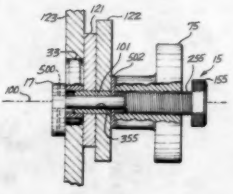
indicator means located on said body for providing a distinctive indication when said coupling means is not at least substantially fully engaged with the adjacent fastener.

4,372,015

BLIND HOLE CLAMPING TOOL

William A. Rhoton, Costa Mesa, Calif., assignor to The Boeing Company, Seattle, Wash.

Filed May 13, 1981, Ser. No. 263,332
Int. Cl.³ A44B 17/00
U.S. Cl. 24—221 R 3 Claims



1. A blind hole clamping tool having a central axis comprising:

a rod member disposed along the central axis, said rod having a knob end portion and a disk-shaped clamp member attached to a further end portion, said rod having a threaded portion intermediate said knob end portion and said disk-like clamp member;

a bushing concentrically disposed about said rod member between said disk-shaped clamp member and said threaded portion of said rod member;

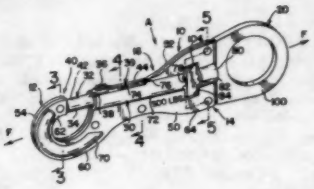
a wheel-shaped member concentrically disposed about said threaded portion of said rod member; and,

a disk-shaped clamp locator, and disk-shaped wheel member concentrically disposed about said bushing between said disk-shaped clamp member and said wheel-shaped member.

4,372,016
HARDWARE SNAP AND METHOD OF PRODUCING SAME

Paul A. LaViolette, North Haven, Conn.; Anthony Caccioli, Longmeadow, Mass.; Alexander Garcia, Berlin, Conn.; Earl H. Hotchkiss, Southington, Conn., and Alfred J. Marchitto, Jr., Glastonbury, Conn., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 3, 1980, Ser. No. 165,737
Int. Cl.³ B16C *1/36*; A44B *13/00*
U.S. Cl. 24—241 PS 42 Claims

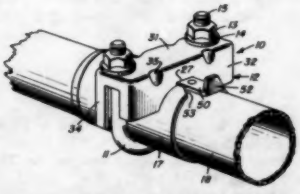


1. In an assembled hardware device including a unitary body having a hook means with an open side for supporting a tension force applied to said device, connector means for connecting said body to an external force supporting element, and an intermediate force transmitting portion between said hook means and said connector means; a keeper member; and means for assembling said keeper member onto said body for selectively opening and closing said open side of said hook means, the improvement comprising: said unitary body including two generally flat sheet metal blanks having connecting surface portions in the planes thereof, and means for securing said connecting surface portions of said blanks in face-to-face relationship, each of said blanks including a hook, a connector portion and an intermediate portion extending between said hook and connector portion, with said hooks of said secured blanks combining to form said hook means.

4,372,017
U-BOLT EXHAUST SYSTEM CLAMP WITH DOUBLE SADDLE

John E. Heckethorn, Dyersburg, Tenn., assignor to Heckethorn Manufacturing Co., Dyersburg, Tenn.

Filed Sep. 17, 1980, Ser. No. 188,262
Int. Cl.³ B01J *6/00*
U.S. Cl. 24—277 6 Claims

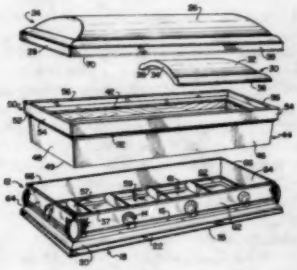


1. A U-bolt clamp assembly adapted for sealing and interlocking a pair of telescoped metal tubes to each other, said clamp assembly comprising a U-bolt and a saddle, said U-bolt having substantially parallel legs threaded adjacent the free ends thereof, and a pipe engaging radius, said saddle having a front face, a rear face parallel to and spaced from said front face, and a top wall connecting said faces, said front face having a primary pipe-engaging radius on its ower edge, said rear face having a secondary pipe-engaging radius on its lower edge, U-bolt receiving apertures in said top wall, a vertical plane through the center line of said apertures being substantially coplanar with said front face pipe-engaging radius, and nuts for engagement on the threaded ends of the U-bolt legs, whereby when applied to a pair of telescoped tubes tightening of said nuts on said U-bolt ends against said top wall will result in the front face pipe-engaging radius and said U-bolt pipe-engaging radius compressing said tubes to form a substantially circumferential indentation therein, said rear face radius bearing upon the outer of the telescoped tubes and serving as a support.

4,372,018
COMBINED CASKET AND BURIAL VAULT ASSEMBLY WITH STACKABLE COMPONENTS

John P. K. Miller, IV, 42 Magnolia Ave., and Benjamin T. Breazeale, II, 39 Maple Ave., both of Okaloosa County, Shalimar, Fla. 32579

Filed Sep. 29, 1981, Ser. No. 306,654
Int. Cl.³ A61G *17/00*
U.S. Cl. 27—35 10 Claims



1. A combined casket and burial vault assembly of molded material comprising:

(a) a casket body having two opposed side walls, two opposed end walls and a bottom wall, said side walls and said end walls tapering outwardly from said bottom wall and terminating at their upper edges in a peripheral flange portion which defines an enlarged top opening for the casket body, said flange portion comprising:

(1) a flared portion extending outwardly from said side walls and said end walls at an angle relative to the vertical which is greater than the taper angle of said side walls and said end walls, respectively,

(2) an upstanding lip portion tapering outwardly from said flared portion at an angle relative to the vertical which is less than the angle of said flared portion, said upstanding lip portion terminating in a free edge surface suitable for receiving a sealant material,

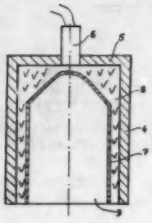
(b) a lid receivable on the enlarged top opening of said casket body, said lid having a convex top porton and a depending peripheral lip portion, said depending lip portion tapering inwardly from said convex top portion at an angle corresponding to the outward taper angle of the upstanding lip portion of the casket, whereby said depending lip portion may be placed in overlapping and gripping relationship with the upstanding lip portion of said casket body when the lid is closed over the enlarged top opening of the casket body, with the free edge surface of said upstanding lip portion thereby being brought substantially into contact with the interior surface of the convex top portion of the lid for retaining a sealant material therebetween; and

(c) a display carrier for receiving said casket body, said display carrier comprising two opposed side walls, two opposed end walls, and a bottom wall.

4,372,019
METHOD OF MANUFACTURING PROJECTILES

Lennart Johansson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Feb. 2, 1981, Ser. No. 230,478
Claims priority, application Sweden, Feb. 18, 1980, 8001265
Int. Cl.³ B21K *21/06*; B21D *39/00*
U.S. Cl. 29—1.23 3 Claims



1. A method for manufacturing an ammunition unit comprising:

forming a shell body of said ammunition unit having at one end a surface shaped for receiving a pipe cap, and a longitudinal surface portion for receiving a driving band;

locating a sleeve material a distance apart from said shell body surfaces, said sleeve material having a shape substantially conforming to the shape of said shell body;

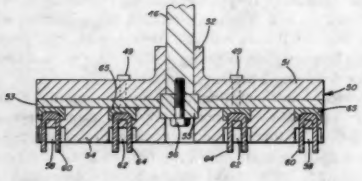
applying an explosive force against said sleeve material in a direction for cladding said sleeve material to said shell body whereby a clad surface is formed on said shell body; and

removing portions of said cladding material to form a pipe cap at said one end, and to form a driving band on said longitudinal surface, whereby an ammunition unit is produced having a pipe cap and driving band which can withstand explosive forces produced during firing of said ammunition unit.

4,372,020
SLAG REMOVAL APPARATUS

Harry E. Anderson, Pittsburgh, and Raymond E. Heasley, McKees Rocks, both of Pa., assignors to Anderson Engineers, Inc., Carnegie, Pa.

Filed May 26, 1981, Ser. No. 267,255
Int. Cl.³ B08B *1/02*
U.S. Cl. 29—81 H 17 Claims

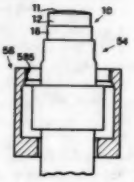


1. Apparatus for removing slag from surfaces of metal shapes, said apparatus including a conveyor belt, at least one vertically movable impact unit located above said conveyor belt, said impact unit including an impact head and means to rotate said impact head, means to adjust the vertical position of said impact unit, a substantially closed cabinet surrounding said impact unit and that portion of said conveyor belt above which said impact unit is located, said cabinet having inlet and outlet openings for said conveyor belt, said impact head including a disc having a peripheral groove formed in the upper surface and an aligned peripheral groove formed in the lower surface, radially aligned pairs of holes extending between said grooves throughout the circumference of said disc, a flexible steel cable extending from said groove formed in the upper surface of said disc through each pair of radially aligned holes and into and through said groove formed in the lower surface of said disc with its ends located below the lower surface of said disc, whereby the ends of said flexible steel cables contact slag on the surfaces of metal shapes passing below said impact head on said conveyor belt and knock the slag off of the surface of the metal shapes by the application of a substantially horizontal force to said slag.

4,372,021
DEVICE FOR MOUNTING AND SECURING A MEMBRANE ON AN AMPEROMETRIC CELL

John M. Hale, Meinier, and Eugen Weber, Hinwil, both of Switzerland, assignors to Orbisphere Corporation Wilmington, Collonge-Bellerive, Switzerland

Division of Ser. No. 164,291, Jun. 30, 1980, Pat. No. 4,325,797.
This application Nov. 9, 1981, Ser. No. 319,708
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 1 Claim



1. A device for mounting and securing a membrane on an amperometric cell, said device comprising a plunger connected with a cam in aligned operative arrangement with a cylinder, a collar for receiving and supporting an amperometric cell near a sensing end thereof; said cylinder and said collar each having end portions for mutual interconnection; said plunger having a resilient member for temporarily pressing a polymer film onto a frontal portion of said sensing end, and a cylindrical surface for temporarily holding an annular member suitable as a die ring for shaping and holding said polymer film on said sensing end; said plunger and said collar being aligned when in said mutual interconnection so that upon movement of said plunger towards said sensing end of said amperometric cell supported by said collar means said annular member is forced from said plunger onto said sensing end while said polymer film is pressed onto said frontal portion of said sensing end.

4,372,022
MACHINE FOR PROGRESSIVELY CLOSING FLANGES OF CAP STRIPS ON STANDING RIB ROOFS

Hubert L. Puckett, Columbus, Miss., assignor to The Ceco Corporation, Chicago, Ill.

Filed Apr. 24, 1980, Ser. No. 143,192
Int. Cl.³ B21D *37/00*
U.S. Cl. 29—243.58 13 Claims

1. A machine for locking sheets of material together by simultaneously deforming a longitudinal metal cap and adjacent edges of said sheets into a seam, said machine comprising:

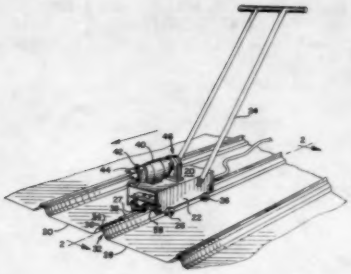
(a) a frame;

(b) a first longitudinal die pivotally carried by said frame and having a contoured face;

(c) a second longitudinal die pivotally carried by said frame, having a contoured face, and disposed laterally with respect to said first die;

(d) a motor means for repeatedly swinging said first and second dies laterally relative to each other, causing the

faces of the first and second dies to oscillate between an open position and a closed position about said cap disposed between said faces, said first and second dies disposed to deform said cap as said first and second dies swing to said closed position; and



(e) a means for mounting said frame for movement along said cap,

whereby the closing of said die faces progressively bends said cap into a seam.

4,372,023

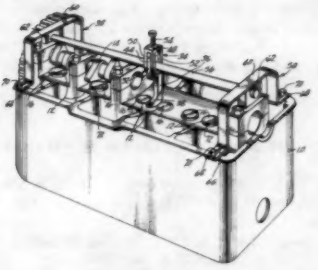
VALVE ADJUSTMENT APPARATUS

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Filed Nov. 24, 1980, Ser. No. 209,676

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—256 **16 Claims**



1. Apparatus for removing a valve adjusting disc from a valve lifter in the valve mechanism of an engine cylinder head, in which the valve lifter bears against a spring-biased valve, and the valve adjusting disc is seated in the valve lifter, the apparatus comprising:

an elongated rigid cross-bar;

means for supporting the cross-bar in a fixed position above the valve lifter;

a force-applying member having an elongated force-applying arm with a working face for contacting the valve lifter and having a socket for slidably engaging the cross-bar for cooperating with the cross-bar for holding the working face of the force-applying arm in a working position in contact with the valve lifter independently of contact with the valve adjusting disc, the socket allowing the force-applying arm to move freely along the length of the cross-bar, to move up and down relative to the cross-bar, and to rotate relative to the cross-bar; and

force-applying means for slidably engaging the cross-bar for being movable freely along the length of the cross-bar, the force-applying means having an adjustment screw for applying an adjustable amount of force to the socket of the force-applying member against the resistance provided by the attachment of the force-applying means to the fixed cross-bar and for retaining said force to compress the working face of the force-applying arm against the valve lifter for moving the valve lifter downwardly relative to the valve adjusting disc to a compressed position in which the valve lifter is retained by the force-applying arm.

4,372,024

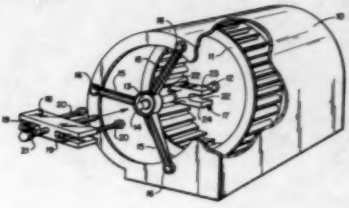
BEARING PUSHER

Mike Shevada, 2856 Yellow Pine Dr., Jacksonville, Fla. 32211

Filed Jun. 5, 1981, Ser. No. 270,770

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—260 **5 Claims**



1. A bearing pusher comprising a pusher portion and a puller portion,

said pusher portion comprising two complementary members,

means for removably joining said members together, said members when joined together providing a centrally disposed hollow cylindrical portion adapted to surround a shaft and two spaced parallel slots co-planar with the axis of said cylindrical portion, said centrally disposed cylindrical portion extending beyond said slots along the axis of said cylindrical portion a distance which is slightly greater than the thickness of the bearing to be pushed, said puller portion comprising a parallelepiped provided with parallel slots extending inwardly from its two opposite smallest faces and a threaded opening centrally disposed in said parallelepiped and parallel to said slots,

a bolt threaded positioned in said threaded opening and

two bolts provided with nuts on each end thereof adapted to fit in the slots of said puller portion and the slots of said pusher portion.

4,372,025

LIGHT SOURCE TO LOCATE NOZZLE IN TANK

Gunter R. Behle, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

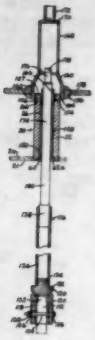
Filed Mar. 16, 1981, Ser. No. 244,500

Int. Cl.³ B23Q *17/00, 3/00*

U.S. Cl. 29—407 **20 Claims**

1. A method of aligning a tank bottom member with a tank top member comprising: forming a bottom opening in a tank bottom; attaching a mounting flange for the bottom member to the tank bottom into said bottom opening; removably attaching a vertically extending light source to the mounting flange; shining the light source upwardly into the tank to indicate a reference point on the internal surface of the tank for locating a tank top opening; marking the reference point; forming a top opening in the tank top at the reference point; locating a tank top member within the tank top opening; said tank top member being hollow; inserting a removable target fixture into said tank top member; shining the light source from the tank bot-

tom onto the target located in the tank top member; and when the light beam in the tank top member is pointed at the center



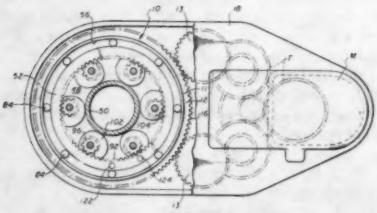
portion of the target, at least temporarily attaching the tank top member to the tank top.

4,372,026

METHOD AND APPARATUS FOR CONNECTING AND DISCONNECTING TUBULAR MEMBERS

Donald E. Mosing, P.O. Box 51729, Lafayette, La. 70505

Filed Sep. 16, 1980, Ser. No. 187,829
Int. Cl.³ B25B *17/00*
U.S. Cl. 29—426.5 **15 Claims**



1. A power energized mechanism for making up and breaking out sections of tubular members and the like said mechanism comprising:

a housing structure;

drive means supported by said housing;

power means for imparting power to said drive means; and

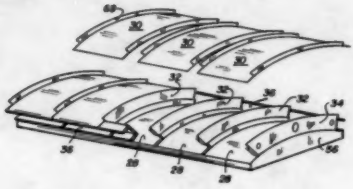
means for engaging said tubular members, said means for engaging being positionable into and out of engagement with the tubular members by said drive means, said means for engaging the tubular members upon actuation of said drive means including curved surfaces thereon defining a uniform motion curve wherein making up or breaking out of said tubular members occurs upon movement of the drive means and said curved surfaces cause engagement and rotation of the tubular members for such making up and breaking out operations as desired without interfering with the surface of the tubular members.

4,372,027

METHOD OF MANUFACTURING PARABOLIC TROUGH SOLAR COLLECTOR

Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Division of Ser. No. 136,828, Apr. 3, 1980, abandoned. This application Jun. 26, 1981, Ser. No. 277,915
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—448 **4 Claims**



1. A method for assembling monocoque stressed parabolic solar collectors comprising the steps of:

(a) form fitting by stretching a plurality of interior parabolic mirror channels to the surface of a male mold fixture with sides of the channels extending upwardly;

(b) positioning a parabolic bow at each side of each interior parabolic mirror channel and fastening said bows to said sides of said stretched channels to form an integral unit;

(c) stretching and positioning an exterior parabolic channel spaced above each of said interior parabolic mirror channels and between each pair of parabolic bows;

(d) attaching said stretched exterior parabolic channels to said parabolic bows to form a stressed module;

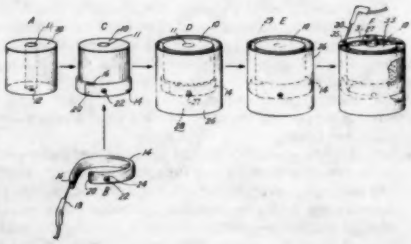
(e) attaching edge channels to the longitudinal edges of said module by attaching said edge channels to the ends of each parabolic bow abutting said edge channels.

4,372,028

METHOD OF MANUFACTURING FOAM INSULATED TANK

Keith R. Clark, and Michael Focia, Jr., both of Montgomery, Ala., assignors to Rheem Manufacturing Company, Montgomery, Ala.

Filed Oct. 6, 1980, Ser. No. 194,425
Int. Cl.³ B23K *31/02*
U.S. Cl. 29—460 **8 Claims**



1. A method of manufacturing a multiple layer water tank of the type including an inner wall, an intermediate layer of expanded foam material and an outer wall comprising the steps of:

(a) forming a flexible, expandable bag in a configuration which may be affixed about the inner wall;

(b) forming voids in the flexible bag by sealing a passage through the bag to define open spaces in the final interme-

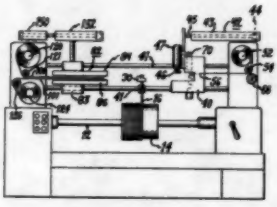
diate layer thereby facilitating assembly connections and installations from the inner wall through the outer wall;
(c) filling the flexible bag with an expandable foam material;
(d) immediately positioning the flexible bag circumferentially about the inner wall to define at least a portion of a mold form between the inner wall and outer wall;
(e) aligning the void of the flexible bag with a connection to the inner wall;
(f) thereafter immediately positioning the outer wall about the inner wall and flexible bag to define a space between the inner wall and outer wall;
(g) orienting a connection of the outer wall with the flexible bag void;
(h) waiting for the flexible bag contents to expand and for the bag to engage simultaneously the inner wall and outer wall and thereby define, at least in part, a mold form in the space between the walls; and
(i) filling the space between the walls with expandable foam material and retaining said material by the expanded flexible bag and the walls.

4,372,029

APPARATUS FOR PROVIDING AN ELECTRICAL COIL WITH LEADS

James W. Morton, Hickory, N.C., assignor to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 34,793, Apr. 30, 1979, Pat. No. 4,262,413. This application Nov. 3, 1980, Ser. No. 203,199
Int. Cl.³ H01R *43/02*
U.S. Cl. 29—564.4 **2 Claims**



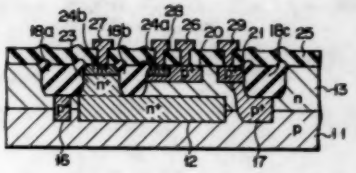
1. A machine for making a coil from conductive wire having an insulating coating bonded thereto and for providing the coil with at least one conductive lead, comprising:
a. winding means for winding the coated wire about a coil axis while advancing the wire along its length past a work station,
b. means for stopping the winding operation when a predetermined region of the wire is located at said work station,
c. a framework located at said work station which is reciprocably movable in a direction transverse to the wire at said work station,
d. insulation-removing means operable to remove a section of said insulating coating from said predetermined region of said wire, thereby providing a section of bare wire at said station,
e. means for releasably fixing to said framework a thin conductive lead-forming strap so that when said framework is moved in said one transverse direction, it carries said conductive strap into a position where it can contact said bare section of wire,
f. means carried by said framework for producing a cold weld between said conductive strap and said section of bare wire when said strap has been carried by said framework into a position where the strap can contact said section of bare wire,
g. a traversing mechanism cooperating with a portion of said wire before the wire portion enters the coil for shifting the wire along the longitudinal axis of the coil so that the coil is wound in layers, said traversing mechanism comprising wire-guiding traversing structure that moves axially of the coil in one direction while one layer is wound and in the opposite direction while the next layer is wound,
h. framework stop means for stopping transverse movement of said framework in preparation for a cold-welding operation, and
i. means for coupling said framework stop means to said traversing structure so that said framework stop means moves through traversing movement with said traversing structure and is located to effect stopping of said framework in a position wherein said cold weld means is aligned with said wire and is then located to effect a weld between said strap and said wire.

4,372,030

METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE

Shinji Saitoh, Yokohama, Japan, assignor to Vlsi Technology Research Association, Japan

Filed Nov. 19, 1980, Ser. No. 208,395
Claims priority, application Japan, Nov. 21, 1979, 54/150977
Int. Cl.³ H01L *21/26*
U.S. Cl. 29—569 R **8 Claims**



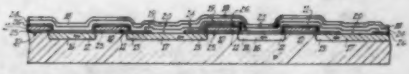
1. A method for producing a semiconductor device comprising the steps of selectively etching a part of a second conductivity type semiconductor layer formed on a first conductivity type semiconductor substrate where an isolating oxide layer is to be formed; introducing a first conductivity type impurity into a substrate contact forming part extending from the bottom of said etched part, by way of the side surface thereof, to the top surface of said second conductivity type semiconductor layer to form a substrate contact; thermally oxidizing said etched part to form an isolating oxide layer; and forming a semiconductor element in said second conductivity type semiconductor layer.

4,372,031

METHOD OF MAKING HIGH DENSITY MEMORY CELLS WITH IMPROVED METAL-TO-SILICON CONTACTS

Shyh-Chang Tsaur, Stafford, and Chang-Kiang Kuo, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1980, Ser. No. 133,375
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—571 **10 Claims**



1. A method of making an array of memory cells in a face of a semiconductor body, each memory cell including an insulated gate field-effect transistor having a gate electrode and a source/drain path between source and drain regions; comprising the steps of:
applying a first layer of conductive material to said face and

patterning such layer to define said gate electrode of each of a plurality of said cells,

introducing conductivity-type determining impurity into said face adjacent said gate electrodes to define said source and drain regions of each of said cells,

applying a second layer of conductive material to said face insulated from said first layer and patterning it to define a connector segment which contacts said source or drain regions at a first contact area for each adjacent set of said cells, each connector segment extending across at least one of said first electrodes, and

applying a metal layer to said face insulated from the first and second layers except at second contact areas and patterning the metal layer to define a plurality of lines each of which extends across a plurality of adjacent sets of cells, the second contact areas being parts of said connector segment spaced from said first contact areas.

4,372,032

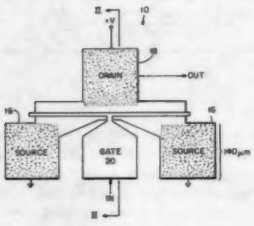
NORMALLY OFF INP FIELD EFFECT TRANSISTOR MAKING PROCESS

David A. Collins, and Derek L. Lile, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 72,399, Sep. 4, 1979. This application Mar. 30, 1981, Ser. No. 248,185

Int. Cl.³ H01L *21/24*

U.S. Cl. 29—571 **6 Claims**



1. In a method for producing a normally off insulated gate field-effect transistor the steps of:

selecting a p-type single crystal indium phosphide substrate;

disposing a source contact and a drain contact spaced apart on said substrate;

disposing a layer of silicon dioxide over said substrate between said source and drain contacts; and

disposing a gate electrode on said layer of silicon dioxide completely bridging the space between said source and drain contacts.

4,372,033

METHOD OF MAKING COPLANAR MOS IC STRUCTURES

Samuel Y. Chiao, West Carrollton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 8, 1981, Ser. No. 300,318

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **14 Claims**

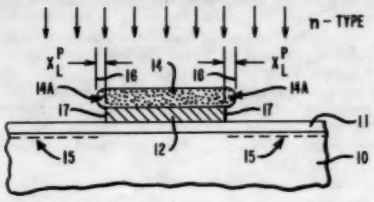
1. A process for forming a recessed oxide region in a portion of a semiconductor substrate comprising:

forming a silicon oxide layer on a surface of said substrate and a silicon nitride layer on a portion of said oxide layer and having edges defining an active area of the substrate;

forming a mask on said nitride layer having at least one edge projecting a predetermined distance beyond the nitride layer;

forming a layer of dopant in said substrate, the edge of said dopant layer being positioned relative to an edge of the nitride layer by said projecting edge of the mask; and

thermally oxidizing the substrate at a relatively low temperature of below approximately 800° C. converting the dopant layer to an oxide region laterally outside said nitride layer.



4,372,034

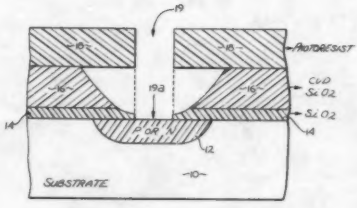
PROCESS FOR FORMING CONTACT OPENINGS THROUGH OXIDE LAYERS

Mark T. Bohr, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 26, 1981, Ser. No. 248,013

Int. Cl.³ H01L *21/265, 21/31*

U.S. Cl. 29—577 C **10 Claims**



1. In the fabrication of an integrated circuit, where a substrate is covered with a thermally grown oxide layer and where a substantially thicker deposited oxide layer containing phosphorus is formed over the grown oxide layer, a process for forming an opening and tapered contact through the oxide layers to expose a region in the substrate comprising the steps of:

forming a photoresist layer over said deposited oxide layer with an opening through said photoresist layer over said region;

etching through said phosphorus containing deposited oxide layer with a wet etchant such that a tapered opening is formed through said deposited oxide layer extending to said grown oxide layer;

removing said photoresist layer; and,

forming an ohmic contact in said tapered opening through said oxide layers;

whereby a tapered contact is formed through said oxide layers.

4,372,035

METHOD FOR MAKING AN ELECTRIC MOTOR HOUSING WITH INTEGRAL POLE

Bobby E. McMillen, Columbus, Miss., assignor to AMBAC Industries, Incorporated, Farmington, Conn.

Division of Ser. No. 82,178, Oct. 5, 1979, Pat. No. 4,296,343. This application Mar. 3, 1981, Ser. No. 240,143

Int. Cl.³ H02K *15/14*

U.S. Cl. 29—596 **5 Claims**

1. A method of producing a housing for an electric machine having an armature and field poles comprising the steps of:

(a) selecting a section of tubular ferrous stock of suitable

length and sufficient thickness to provide mechanical stability when deformed and assembled with other structural members;

(b) deforming portions of the sidewalls of the selected tubular section to provide generally parallel flattened surfaces and inwardly projecting pole pieces which generally conform to the shape of the armature and are of the general size and shape required for induction effects to generate induced field poles; and

(c) securing magnetic field pole pieces in alternate circumferential positions between the inwardly projecting regions to provide a housing structure wherein the inner arcurate surfaces of the magnetic field poles and the inwardly projecting pole pieces are equally spaced radially with respect to the circumferential surface of the armature.

4,372,036

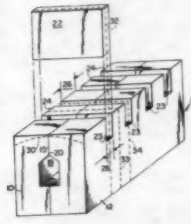
METHOD OF MANUFACTURING A SINGLE-TRACK VIDEO FERRITE RECORD/REPRODUCE HEAD

John F. Bagby, Encinitas, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Continuation of Ser. No. 734,698, Oct. 21, 1976, abandoned, which is a division of Ser. No. 668,873, Mar. 22, 1976, Pat. No. 4,017,899, which is a continuation-in-part of Ser. No. 519,358, Oct. 29, 1974, abandoned. This application Sep. 22, 1978, Ser. No. 944,685

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. The method of manufacturing a structure for use in the manufacture of a narrow, single track, gap protected video magnetic record and/or reproduce head comprising the steps of:

(a) bonding two ferrite bars together, as least one of said bars being provided with a chamferred surface, said bonding being such that first and second predetermined gaps are maintained between said bars with the chamfer forming an elongated window between said bars;

(b) slotting said bonded bars across said first gap so as to produce aligned constant width ferrite abutments with track-defining edge walls bounded by said slots, the depth of said slots extending just into said window between said bars, but not extending so far into said elongated window between said bars that substantially the whole cross-section of said window is cut through;

(c) bonding thin ceramic wall support pieces, which are narrower than said abutments and which wear faster than said ferrite bars, in said slots of said bars and against said track-defining edge walls, said support pieces not substantially covering the cross-section of said elongated window because of the shallowness of said slots;

(d) machining said bonded bars and ceramic pieces to form a contoured, polished assembly; and

(e) dicing said assembly parallel to said edge walls and through said thin ceramic wall support pieces and the underlying ferrite to produce a discrete magnetic transducer structure having ceramic extending across and to the sides of said first gap thereof for supporting, and preventing the crumbling of, the track-defining edge walls of the ferrite.

4,372,037

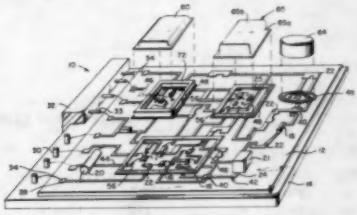
LARGE AREA HYBRID MICROCIRCUIT ASSEMBLY

Robert Y. Scapple, Los Angeles; Frank Z. Keister, Culver City; Robert G. Grieger, Marina Del Rey, and Richard P. Himmel, Mission Viejo, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 774,298, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 554,787, Mar. 3, 1975, abandoned. This application Dec. 17, 1979, Ser. No. 104,471

Int. Cl.³ H01C *17/02*

U.S. Cl. 29—613 **5 Claims**



1. A method for fabricating a large area hybrid microcircuit assembly comprising the steps of:

placing thick film multilevel conductor, resistor and dielectric patterns on a substrate, including at least one selected area for later placing of electronic components to be hermetically sealed therein;

trimming all of the resistors in the patterns;

placing at least one closed loop of thick film dielectric material around the selected area, and over all input, output and ground leads extending from the patterns and terminating within the selected area;

placing a closed loop of thick film sealing metal over each dielectric material closed loop in which the sealing metal consists of a solderable composition which is compatible with the dielectric material;

securing a closed ring frame to each sealing metal closed loop by a first solder consisting of a composition which is sufficiently ductile for militating against fracture and leakage thereof;

electrically and mechanically securing any discrete electrical components to the patterns and the substrate outside of the selected area;

mounting the electronic components to the substrate within the selected area and the closed ring frame, and electrically coupling the components to the input, output and ground leads therein;

sealing a cover to each closed ring by a second solder consisting of a composition which is capable of forming a hermetic seal and withstanding thermal and mechanical shock and repeated temperature cycles such as from −65° to 150° C., and which has a melting point lower than the first solder, and providing a non-reactive environment within the sealed selected area for safeguarding the elec-

tronic components from otherwise degrading environment; and

electrically and environmentally testing the assembly.

4,372,038

METHOD FOR ASSEMBLING AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 23, 1981, Ser. No. 286,217

Int. Cl.³ H01M *2/06*

U.S. Cl. 29—623.2 **14 Claims**

1. A method for assembling a carbon current collector cathode structure for an electrochemical cell, comprising the steps of:

providing an elongated porous carbon element having a guide opening extending therealong for a portion of its entire length;

providing a unitary metal current collector element comprising first and second elongated, spaced-apart, tapered, resilient spring members having a pair of spaced-apart free ends and an opposing pair of ends joined together and defining a tapered central opening between the spring members and a generally V-shaped, tapered form for the current collector element;

securing the free ends of the current collector element to a feedthrough member having a cover attached thereto thereby to provide a rigid assembly jointly with the current collector element;

introducing the current collector element into the guide opening in the porous carbon element; and

pushing the assembly of the cover, the feedthrough member, and the current collector element along the porous carbon element thereby to cause the current collector element to penetrate the material of the carbon element beyond the termination of the guide opening in the carbon element and thereby embed the current collector element within the carbon element, said current collector element being dimensioned relative to the guide opening in the carbon element to exert an outwardly directed force by way of the spring members against internal portions of the carbon element when the current collector element has been embedded within the carbon element.

4,372,039

COIL GUIDE MEMBER FOR COIL INSERTION TOOL

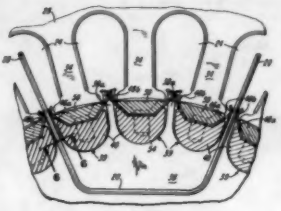
Curtis R. Bailey, Dayton, Ohio, assignor to Machine Products Corporation, Dayton, Ohio

Filed Dec. 29, 1980, Ser. No. 220,914

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—734 **11 Claims**

1. In apparatus for insertion of a pre-wound coil of electrical conductor wire into an electric machine stator provided with spaced-apart internal teeth forming slots therebetween, a coil guide member, the coil guide member being positioned in juxtaposition with one of the teeth of the stator along the length thereof to guide a portion of a coil of wire into a slot adjacent said one of the teeth, the coil guide member comprising an elongate body provided with a channel therein which extends substantially the length thereof, a wire protector member having a part within the channel and extending substantially the length of the channel, the wire protector member having flexible projections extending from the channel and in covering relationship with portions of the tooth with which the coil guide member is in juxtaposition, for protection of a coil as the coil is guided by the coil guide member into a slot adjacent the tooth.



4,372,040

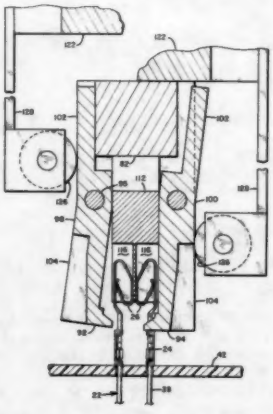
TOOL FOR PRESS-FITTING A PLURALITY OF CONNECTOR TERMINALS

Thomas J. Wickham, Lakeville, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Division of Ser. No. 115,839, Jan. 28, 1980, Pat. No. 4,316,321. This application Aug. 10, 1981, Ser. No. 291,684

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—741 **4 Claims**



1. A tool for press-fitting a plurality of connector terminals to a substrate, said terminals being arranged in a pair of rows with the terminal pairs having contact heads facing each other, the shanks of said terminals being inserted into respective apertures within said substrate, said shanks each having an enlarged section for press-fitting into the respective aperture, said tool comprising:

a first member;

first and second cam members pivotally mounted to said first member for movement between a rest position and an actuated position, said cam members having a plurality of

notches each receiving a portion of a respective shank of one of said terminals when said cam members are in their actuated position;

cam operator means supported by said first member for moving said first and second cam members from their rest to their actuated position; and

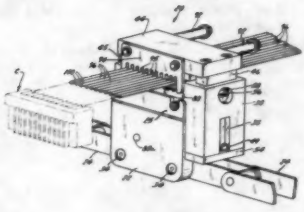
a second member supporting said first member in sliding relation so that upon positioning said tool over the terminals, operation of said cam operator means moves said first and second cam members to their actuated position so that a portion of each of the shanks of said terminals is received in individual ones of said notches above said enlarged section, and subsequent movement of said first member downwardly toward said substrate will cause said cam members, carried by said first member, to engage an upper surface of each of said enlarged sections to force said terminals downward and to press said enlarged section into the respective aperture.

4,372,041

WIRE CONVEYING CLAMP AND APPARATUS FOR ASSEMBLY OF ACCURATELY SIZED WIRE ENDS TO A TERMINAL

John H. Winkelman, Hartland, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Mar. 19, 1981, Ser. No. 245,252
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—747 **23 Claims**



1. A wire conveying clamp assembly for use in an apparatus for high-speed assembly of free ends of accurately sized wire leads to the terminals in a connector and of the type having an endless chain mounted on a pair of sprockets for rotation of said chain in a flat, orbital path, a plurality of said clamp assemblies secured to said chain for movement therewith, each of said assemblies including a side plate support fixedly attached to said chain, said side plate support having a clamp housing slidably attached thereto, said clamp housing being slideably mounted on and movable along said support in a direction parallel to the path of movement of said chain, said housing further having a vertically movable clamp arm slidably mounted thereon; said clamp arm having guide pin means slideably engaged therein, a comb attached to one end of said pin means and engaging said wire leads, pusher means for moving said comb and said guide pin means transversely relative to said chain path to thereby cause separation of said free ends of said wire leads.

4,372,042

METHOD FOR MANUFACTURING DIAMOND PICK-UP STYLUS

George F. Hughes, Palm Beach Gardens, Fla., assignor to Diamagnetics, Inc., West Palm Beach, Fla.

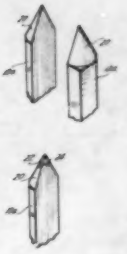
Filed Sep. 12, 1980, Ser. No. 186,682
Int. Cl.³ H01R *43/00*; B24B *1/00*; B28D *5/04*
U.S. Cl. 29—825 **4 Claims**

1. A method for forming a pick-up stylus for playing back pre-recorded signals on a record disc, said method comprising the steps of:

(a) providing a pair of elongated jewel elements, each of said elements having a generally flat surface extending parallel to the longitudinal axis of said element;

(b) joining said jewel elements along said flat surfaces whereby to form an elongated work product having a forward end;

(c) rough grinding said work product forward end to a conical surface;



(d) separating said work product along said joined flat surfaces into two jewel elements each having a semi-conical surface at the forward end thereof; and,

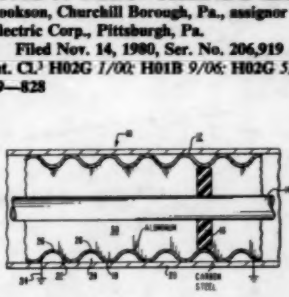
(e) fine grinding pair of planes onto each jewel element semi-conical surface, said planes extending from said jewel element flat surface and intersecting along a line defining a record engaging edge.

4,372,043

METHOD OF ASSEMBLING A GAS-INSULATED POWER TRANSMISSION LINE WITH DUTER ENCLOSURE OF CARBON STEEL AND ALUMINUM

Alan H. Cookson, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1980, Ser. No. 206,919
Int. Cl.³ H02G *1/00*; H01B *9/06*; H02G *5/06*
U.S. Cl. 29—828 **1 Claim**



1. A method of assembling a high-voltage, gas-insulated power transmission line comprising the steps of:

forming a gas-tight cylindrical outer sheath of carbon steel;

placing the outer sheath in its final installation location;

inserting an insulatably supported inner conductor in a cylindrical aluminum inner sheath in a manufacturing facility to form an inner sheath-inner conductor assemblage;

transporting the inner sheath-inner conductor assemblage to the location of said outer sheath; and sequentially

inserting said inner sheath-inner conductor assemblage in said outer sheath after said outer sheath has been placed in its final installation location;

grounding said inner sheath; and

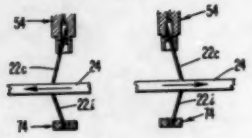
inserting an electrically insulating gas in said outer sheath.

4,372,044

METHOD OF AND APPARATUS FOR STRAIGHTENING TERMINAL PINS

William M. Chisholm, Midlothian, Va., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,805
Int. Cl.³ H05K 3/22; B23P 19/00; B21F 1/02
U.S. Cl. 29—845 19 Claims



1. A method of straightening an elongated pin having an intermediate portion and first and second opposite end portions, comprising the steps of:

gripping the pin in a gripping means;

causing relative movement between a substrate and the gripped pin to insert the pin into the substrate;

maintaining the gripping means about at least a tip portion of the first end portion; and

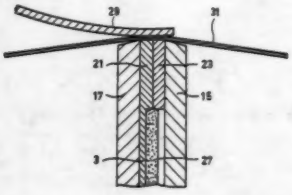
causing relative reciprocating movement between the intermediate portion of the pin in the substrate and tip portions of the first and second opposite end portions of the pin to flex and coldwork the first and second opposite end portions of the pin in a lateral direction is simultaneously.

4,372,045

METHOD OF MANUFACTURING ELECTROSTATIC WRITE HEAD

Pol A. G. J. Gustin, and Raymond G. G. Schayes, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 124,155, Feb. 25, 1980, Pat. No. 4,300,146, which is a continuation of Ser. No. 962,265, Nov. 20, 1978, abandoned. This application Feb. 11, 1981, Ser. No. 233,425
Claims priority, application Belgium, Dec. 8, 1977, 183,188
Int. Cl.³ H05K 3/00
U.S. Cl. 29—846 9 Claims



8. A method of manufacturing an electrostatic write head having a medium scanning end, comprising the steps of:

providing an insulating plate having one side which is substantially planar;

providing a plurality of printed circuit-type conductor tracks on said one side of said plate, said conductor tracks each terminating in a strip-shaped region on said plate, successive laterally adjacent conductor tracks entering said strip-shaped region from opposite directions, the parts of said conductor tracks situated inside said strip-shaped region extending parallel to each other, and the parts of said conductor tracks situated outside said strip-shaped region forming connection conductors;

dividing said plate into first and second sections along a dividing line which extends through said strip-shaped region perpendicularly to and through each of said conductor tracks in said strip-shaped region, thereby forming two ends on each conductor track proximate to said dividing line;

rotating said first and second sections towards each other around said dividing line so that the sides thereof accommodating conductor tracks face each other, said ends of said conductor tracks proximate to said dividing line constituting the medium scanning end portion of the electrostatic write head;

providing an insulating layer between a portion of said first and second sections intermediate said conductor tracks at an area spaced from said dividing line, and

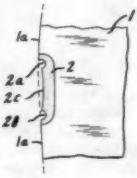
adhesively joining said rotated first and second sections together, thereby providing an integral head.

4,372,046

METHOD OF MAKING A SWITCHING ELECTRODE PORTION OF A PCB

Keiichi Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 935,097, Aug. 21, 1978, abandoned. This application Oct. 10, 1980, Ser. No. 195,930
Claims priority, application Japan, Aug. 24, 1977, 52-113129[U]
Int. Cl.³ H01K 3/10
U.S. Cl. 29—852 7 Claims



1. A method of forming an electrode on a peripheral surface portion of a circuit board, comprising:

providing a base plate for a circuit board having a pair of major surfaces and a narrow peripheral surface extending between said pair of major surfaces;

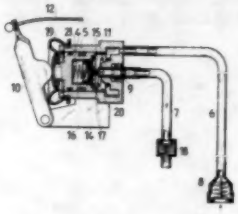
forming through said base plate two small holes spaced a certain distance from each other and each extending between the pair of major surfaces of said base plate;

forming through said base plate a large hole having a diameter greater than the distance between the two small holes and which intersects the two small holes;

plating with a conductive layer inner surfaces of said base plate defining the two small holes and only that portion of the surface of said base plate defining the large hole which is between the two small holes, wherein said conductive layer defines an electrode; and

removing the portion of said base plate containing the unplated portion of said large hole opposite said conductive layer so that the surface portion of said base plate on which said conductive layer is plated is a peripheral edge portion of said base plate and said conductive layer defines an electrode on a peripheral edge portion of said base plate.

4,372,047
DISPENSING MEANS FOR SAPLING CONTROL SUBSTANCE CONNECTED WITH A LAND CLEARING SAW
Toivo Marttinen, Puntala, Finland, assignor to Enso-Gutzeit Osakeyhtiö , Helsinki, Finland
Filed Dec. 11, 1980, Ser. No. 215,408
Int. Cl.³ B27B 9/00
U.S. Cl. 30—123.3 3 Claims

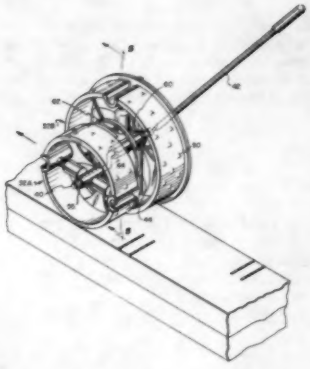


1. Improvement in a connection with a land clearing saw, a sapling control substance dispensing means comprising a container for the sapling control substance, a control substance nozzle and a control substance duct leading from the container to the nozzle, this duct incorporating a manually operable valve comprising a piston provided with return spring and a cylinder, with ports for the control substance entry duct and exit duct, these ducts being provided with check valves, wherein the improvement comprises that within the piston has been installed an auxiliary piston loaded with a spring and which as the piston is being moved opens or closes a needle valve associated with the exit duct port.

4,372,048
OPTICAL FIBER CLEAVER WITH PULLER
Rocco F. Basile, Roselle; Kenneth P. Blum, Colonia, both of N.J., and John M. Cole, New Hope, Pa., assignors to Thomas & Betts Corporation, Raritan, N.J.
Filed Jan. 14, 1980, Ser. No. 111,845
Int. Cl.³ A21C 5/08; B25F 3/00
U.S. Cl. 30—124 12 Claims

1. Optical fiber cleaving apparatus comprising:
fiber support means for supporting a fiber non-rotatively thereon;
fiber cleaving means supported by said fiber support means and having a cutting element movable transversely relative to the axis of said fiber, and means limiting such cutting element movement such that only a portion of the periphery of said fiber is intersected upon movement of said cutting element;
means supported by said support means at one side of said cleaving means for holding said fiber in a fixed longitudinal position; and
pulling means supported by said support means at the opposite side of said cleaving means for grasping said fiber and pulling said fiber in a longitudinal direction during said holding of said fiber and subsequent to cleaving thereof.

4,372,049
FRAMING LAYOUT METHOD AND DEVICE
Utah Hogue, 11417 Seagoville Rd., Balch Springs, Tex. 75180
Filed Jun. 29, 1981, Ser. No. 278,174
Int. Cl.³ B43L 13/00
U.S. Cl. 33—36 7 Claims

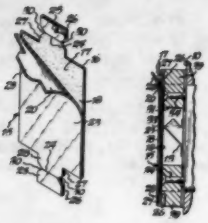


1. A multi-wheeled framing layout device comprising:
at least two eccentrically mounted, adjacent wheels of differing diameters, each said wheel having a hub, a periphery, and a substantially open means for support connecting said periphery to said hub;
an axle rotably engaging said hubs;
an offset in said axle set between said adjacent wheels;
said offset disposing the wheels in said eccentrically mounted relation and with the periphery of said adjacent wheels into an alignment orientation for simultaneously rolling said wheels in contact with a single planer surface;
means for securing said wheels upon said axle;
a handle attached to an end of said axle in a nonrotable connection; and
means for marking said planer surface at the periphery of each of said wheels.

4,372,050
PANEL MARKING CONSTRUCTION
Elroy C. Eisenhauer, 775 Tifft St., Buffalo, N.Y. 14220
Filed Jun. 12, 1978, Ser. No. 914,441
Int. Cl.³ G01B 3/14
U.S. Cl. 33—174 G 5 Claims

1. A templet construction for marking a portion on the rear of a member to be mounted on a substructure comprising a templet of a predetermined shape fabricated from flexible sheet-like material, a first area of pressure-sensitive adhesive on said templet, a second area of pressure-sensitive adhesive of lesser size than said first area for attaching said templet to said substructure with said first area facing away from said substructure so that said first area will adhere to said rear of said member when said member is pressed against said first area facing away from said substructure, said second area being a continuation of said first area on the same side of said sheet-like

material as said first area, said templet being bendable between said first and second areas to cause said first and second areas to face in opposite directions whereby said second area can be pressed against said substructure with said first area facing



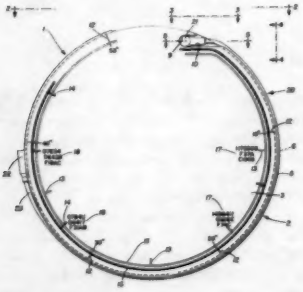
away from said substructure toward said member, and locating means for providing a demarcation between said first and second areas to thereby facilitate the bending back of said second area relative to said first area, said locating means comprising V-shaped cutouts facing each other.

4,372,051

SPARK PLUG WIRE GAUGE

Richard F. Cocklin, 3226 Diamond St., NE., North Canton, Ohio 44721

Filed Aug. 31, 1981, Ser. No. 297,783
Int. Cl.³ G01B 5/02
U.S. Cl. 33—174 R **12 Claims**



10. A device for measuring spark plug wires including:
(a) a body;
(b) spark plug wire holding means formed on the body for detachably holding a spark plug wire in a predetermined curved path along said body; and
(c) marking means provided on the body at predetermined spaced locations with respect to the spark plug wire holding means for indicating the length of a spark plug wire extending along the curved path.

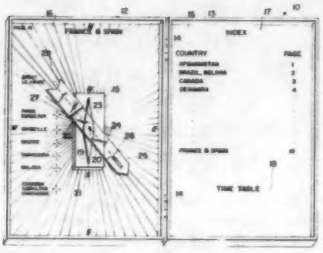
4,372,052

DEVICE FOR INDICATING DIRECTION TO A PREDETERMINED LOCALE

Edmond K. Wakim, P.O. Box 8, Hazmieh, Lebanon

Filed Nov. 7, 1980, Ser. No. 204,868
Int. Cl.³ G01C 9/00, 17/14
U.S. Cl. 33—349 **5 Claims**

1. In a device for indicating the direction of a predetermined locale from a specific geographic location at any point in the world, a compass having a magnetic needle pivotally mounted on a pivot, a plurality of azimuth cards and each card representing a particular geographic region, there being a plurality of indicia markings on each card corresponding to specific geographic locations in said region, said azimuth cards each having an opening therein to accommodate the magnetic needle when a said card is positioned on the compass such that each card is selectively positionable upon said compass in a predetermined relationship to said magnetic needle corresponding to the specific geographic location at which the device is being used with respect to a North-South reference, means for orienting a said azimuth card on said compass with respect to said magnetic needle, a transparent adjustable straight-line cursor pivotally mounted upon a pivot coinciding with the pivot of the compass magnetic needle and having a



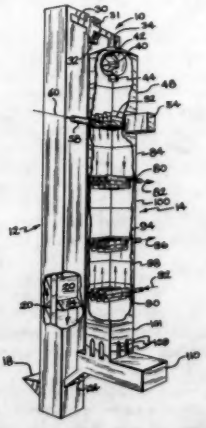
straight line thereon to be aligned with said magnetic needle pivot and with a said indicia marking on a said azimuth card which is positioned upon the compass whereby the cursor will indicate the direction of the predetermined locale from said specific geographic location when said compass magnetic needle is aligned with the North-South reference, said cursor having a head end which points to the predetermined locale and a tail end which is aligned with an indicia marking on the card, one of said head end and tail end being foldable and the other of said head end and tail end being slidable to decrease the length of the cursor when positioning a card upon the compass.

4,372,053

DRYER FOR PARTICULATE MATERIAL

Robert J. Anderson, and Glenn E. Hall, both of Toledo, Ohio, assignors to The Andersons, Maumee, Ohio

Filed Nov. 21, 1980, Ser. No. 209,140
Int. Cl.³ F26B 3/16, 17/14
U.S. Cl. 34—11 **30 Claims**



1. Method of drying particulate material comprising:

filing an enclosed chamber with a batch of particulate material to be dried;

passing the batch of particulate material through the enclosed chamber;

introducing a heated fluid into at least one portion of the enclosed chamber defining a heating zone to heat and absorb moisture from the particulate material, whereby the heated fluid absorbs a portion of the moisture to be removed from the particulate material as the particulate material moves though the heating zone;

introducing a heated fluid into at least one portion of the enclosed chamber defining a cooling zone to cool and absorb moisture from the heated particulate material whereby the cooling fluid absorbs a portion of the moisture to be removed from the particulate material as the particulate material moves through the cooling zone; and

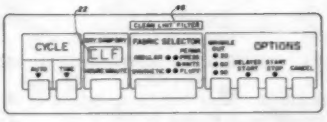
continuously recirculating the particulate material of the batch through the enclosed chamber to progressively remove moisture from the particulate material, the particulate material being recirculated through the chamber until the desired degree of drying is achieved in substantially the entire batch of particulate material.

4,372,054

METHOD AND MEANS FOR PROGRAMMING THE OPERATION OF AN APPARATUS

Daniel I. Pomerantz, Lexington, Mass., and Richard V. Baxter, Jr., Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 2, 1981, Ser. No. 230,736
Int. Cl.³ F26B *21/06*
U.S. Cl. 34—44 **12 Claims**



1. An apparatus having at least a plurality of different control functions, comprising:

a control panel including a plurality of separate portions each of which corresponds to a different said control function;

means for causing said control panel to appear blank prior to initial activation of said apparatus;

means for initially activating said apparatus; and

means responsive to said means for initially activating for indicating and allowing selection of said different control functions, said means for indicating and allowing selection including means for sequentially displaying said control functions in their respective control panel portions to allow sequential selection thereof, said means for sequentially displaying including means for sequentially illuminating each of said portions of said control panel in response to said means for initially activating and in response to selections of control functions corresponding to illuminated control panel portions, said selected control functions remaining illuminated during the sequential illumination of further portions of said control panel.

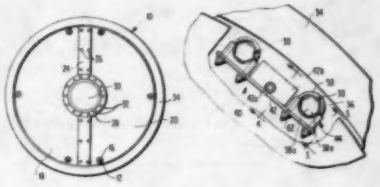
4,372,055

THERMAL INSULATION END PANEL MOUNTING BRACKET ASSEMBLY FOR PAPER MACHINE DRYER CYLINDER

Fred H. Alexy, Glens Falls, N.Y., assignor to AMG Industries, Inc., Glens Falls, N.Y.

Filed May 1, 1981, Ser. No. 259,778
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—110 **8 Claims**

1. An end panel mounting bracket assembly for mounting a planar thermal insulation panel onto an exposed end of a paper dryer drum or the like, said drum comprising an elongated metal cylinder, dryer head end bells carried on respective ends of said cylinder and being bolted thereto by a plurality of drum head bolts at spaced circumferential positions along said end bells and with the bolt heads at spaced circumferential positions along said end bells and with the bolt heads projecting from the face of the end bells, said mounting bracket assembly comprising:



an elongated bracket member separate from said insulation panel and spanning between two spaced bolt heads to define at least one accurate panel fixing point delimited by both of said bolt heads,

at least one clamp member fixed to said bracket member and surrounding one of said bolt heads and being frictionally clamped thereabout, and

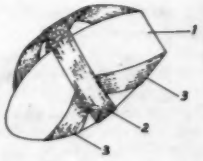
means for detachably fixedly mounting said panel within the end of said cylinder and to one of said members, overlying said members and spanning across the end of said cylinder.

4,372,056

TREADS

Florence Benaquista, 524 Lincoln Ave., Pittsburgh, Pa. 15202

Filed Jan. 2, 1981, Ser. No. 222,725
Int. Cl.³ A43B *3/10, 15/00*
U.S. Cl. 36—7.7 **1 Claim**



1. A pair of non-skid half soles having a non-skid outer tread design to prevent slipping and falling on icy streets, elastic strap means inter-connecting extended side portions of each of said half soles, said elastic strap means comprises a single strap for each half sole and a pair of angularly extending straps on each side of the half sole connected to the front and rear portions of said half sole, said flexible strap means being foldable to enable carrying of said half soles in a compact package.

4,372,057

INSOLE

Olympia Nielsen, 333 E. 66th St., New York, N.Y. 10021

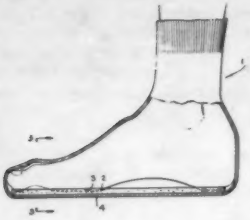
Filed Jul. 10, 1980, Ser. No. 167,243
Int. Cl.³ A43B *3/10, 13/38*
U.S. Cl. 36—10 **1 Claim**

1. An improved moisture absorbing foot covering comprising the combination of:

a woven foot sock having integral sole and upper portions;

a moisture absorbing resilient insole of cellular material

positioned within said sock and substantially covering the inner surface of the sole of said sock; and



said insole being shaped to generally conform to the shape of the sole of a human foot.

4,372,058

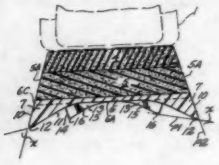
SHOE SOLE CONSTRUCTION

Jerry D. Stubblefield, 12225 NW. Big Fir Ct., Portland, Oreg. 97229

Continuation of Ser. No. 935,584, Aug. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 853,482, Nov. 21, 1977, abandoned. This application Sep. 10, 1980, Ser. No. 185,957

Int. Cl.³ A43B *13/04, 13/18, 13/26, 5/00*

U.S. Cl. 36—32 R **43 Claims**



1. An outer sole for an athletic shoe, which comprises:

a lower surface bounded by a peripheral portion having an outer edge;

means for dissipating shock away from the foot and leg of a wearer comprising a plurality of tread members extending integrally from and disposed about said peripheral portion of said lower surface for supporting said lower surface in a cantilever fashion, certain of said tread members having a vertical section that forms an obtuse triangle having a lowermost apex that extends laterally beyond said outer edge of said outer sole for spreading laterally outwardly upon foot-initiated ground impact.

4,372,059

SOLE BODY FOR SHOES WITH UPWARDLY DEFORMABLE ARCH-SUPPORTING SEGMENT

Frank Ambrose, 5805 Washington St., Apt. #17, Hollywood, Fla. 33023

Filed Mar. 4, 1981, Ser. No. 240,484

Int. Cl.³ A43B *13/04, 13/18*

U.S. Cl. 36—32 R **6 Claims**

1. In a shankless sole body for shoes having:

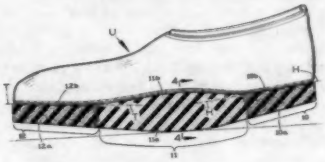
a heel-supporting rear segment with a top face and a bottom face;

an arch-supporting middle segment of deformable resilient material extending forward from said rear segment and having a top face and a bottom face merging smoothly with said top and bottom faces of said rear segment;

and a toe-supporting front segment extending forward from said middle segment and having a top face and a bottom face merging smoothly with the top and bottom faces of said middle segment;

the improvement wherein:

said top face of the middle segment is convex longitudinally of the sole across substantially its complete width and projects above the respective planes of the top face of said rear segment and the top face of said front segment, said bottom face of said middle segment is convex longitudi-



nally of the sole across substantially its complete width and projects below the bottom faces of said rear and front segments, said middle segment at any point thereon longitudinally of the sole has a substantially uniform vertical thickness across its complete width, and said middle segment is resiliently deformable under the wearer's weight to flatten its bottom face and push its top face up against the arch of the wearer's foot to redistribute the wearer's weight onto the arch.

4,372,060

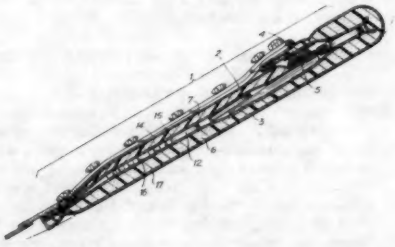
CONSTRUCTION OF TONGUE FOR SHOE OR THE LIKE ARTICLE

Jaroslav F. Adamik, Santa Ana, Calif., assignor to MCF Footwear Corporation, New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,413

Int. Cl.³ A43B *23/26*

U.S. Cl. 36—54 **4 Claims**



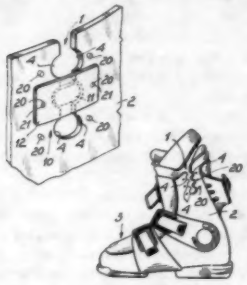
1. A tongue for use with an article of footwear, in the form of a receptacle, including a first lower member and a second overlaying member, said members having their side portions joined together, the upper portion of said first overlaying member having separable fastener closure means affixed thereto and the upper portion of said lower member having an integrally formed flap member having mating separable fastener closure means affixed thereto so as to facilitate selective separable mating of said fastener closure means to provide selective access to said receptacle, said upper portion of said first and second members extending above the upper lace line of the footwear, and cushioning means formed as part of said first and second members and being disposed beneath an outer surface portion of each of said overlaying members so as to surround an article placed within said receptacle.

4,372,061

DEVICE FOR ADJUSTING THE FLEXIBILITY OF A SKI BOOT OR THE LIKE ARTICLE

Alessandro Pozzobon, Treviso, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed May 4, 1981, Ser. No. 260,153
Claims priority, application Italy, May 23, 1980, 21895 B/80
Int. Cl.³ A43B 5/04
U.S. Cl. 36—117 4 Claims



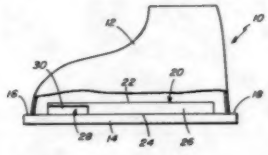
1. In a ski boot or the like, a device for adjusting the flexibility thereof, comprising at least one longitudinally extending cut provided at the top free end of the shell of the ski boot, characterized in that it further comprises, formed in the edges of said cut, a plurality of oppositely located pairs of notches, there being further provided a stiffening member adapted for removable insertion through one of said notch pairs and preset to adjust the degree of flexibility in said ski boot shell.

4,372,062

SKI BOOT

Robert D. Tringali, New York, N.Y., assignor to Joel H. Eisenberg, Stratford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,778
Int. Cl.³ A43B 5/04
U.S. Cl. 36—120 27 Claims



1. A ski boot comprising:
an outer boot, and
an insert,
said insert supporting the foot of a skier and having means for transmitting forward pressure exerted by the foot in the anterior progression plane into pressure on the antero-medial region thereby weighting the inboard edge of a ski attached to said boot.

4,372,063

BRUSH CLEARING APPARATUS FOR A BULLDOZER BLADE

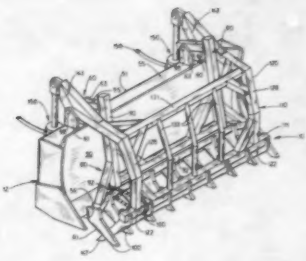
Casey N. Work, P.O. Box 306, Dunlap, Calif. 93621

Filed Mar. 30, 1981, Ser. No. 249,183
Int. Cl.³ A01B 13/00
U.S. Cl. 37—2 R 7 Claims

1. A brush clearing apparatus for mounting on a bulldozer blade or the like, the blade having an upper edge, a lower edge, a bulldozing face extended transversely of a predetermined longitudinal direction of bulldozing movement to engage materials being bulldozed when the blade moves in such direction, and a face opposite of the blade from the bulldozing face, the apparatus comprising:

A. a rake which has a plurality of transversely spaced rake teeth and is mounted on the blade in an attitude in which the teeth extend in said direction from the bulldozing face and downwardly from the lower edge;

B. a clamp mounted on the blade for pivotal movement about a transversely extending clamp axis which is adjacent to the upper edge of the blade, the clamp having a distal portion which is spaced from the axis substantially



the distance between the axis and the lower edge and teeth which extend from the distal portion and are disposed transversely in alternating spaced relation between the rake teeth, the clamp being adapted to pivot about the axis between a lowered position, in which the distal portion is longitudinally adjacent to the bulldozing face and is elevationally adjacent to the lower edge and in which the rake teeth and the clamp teeth are disposed in interfitted relation, and a raised position in which the distal portion and clamp teeth are disposed substantially upwardly of the upper edge; and

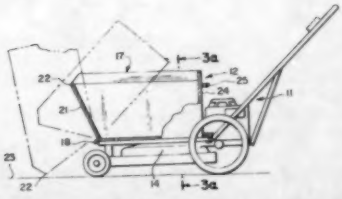
C. power means connecting the clamp and the blade selectively for pivoting the clamp toward the lowered position and toward the raised position.

4,372,064

POWER LAWN MOWER WITH DUMPING RECEPTACLE

Louis Benenate, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Feb. 2, 1981, Ser. No. 230,665
Int. Cl.³ E02F 3/02
U.S. Cl. 37—117.5 3 Claims



1. A high wheel dumpster assembly, comprising in combination, a high wheeled rotary power lawn mower, and a dumpster mounted thereupon comprising a frame bolted thereto and a hopper pivotably mounted on a front end of said the frame, and means for said hopper to be used for bulldozing work wherein said hopper includes a handle at one end for tilting said hopper wherein said means comprises a scoop

pivotably secured to said hopper and forming an end wall thereof pivotable relative to said hopper to an outward position and to an inward position including means for locking said scoop in said inward position.

4,372,065

BLOWER FOR A PRESSING TABLE

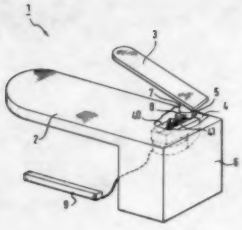
Jutta Riha nee Hildebrand, Rosenbergstr. 26, D-5455 Hardert, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,232

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938789

Int. Cl.³ D06F *71/34*

U.S. Cl. 38—15 **6 Claims**



1. A blower for a pressing table, said blower including fan means, a suction side of said fan means and a blowing side of said fan means, passage means for connecting said suction side and said blowing side to a said pressing table in which the blower is incorporated, and alternately operable deflector means having a suction position in which said suction side of said fan means is communicated to said passage means and having a blowing position in which said blowing side of said fan means is communicated with said passage means, said deflector means being operable to switch from said suction position to said blowing position but not from said blowing position to said suction postion until said fan means has been deactivated.

4,372,066

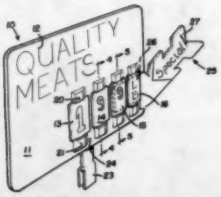
HIGHLIGHTING MARKER FOR MERCHANDISE PRICE SIGN

Robert J. Slavsky, Sr., Lathrup Village, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.

Filed Jul. 16, 1981, Ser. No. 284,073

Int. Cl.³ G09F *7/08*

U.S. Cl. 40—124.1 **7 Claims**



1. A temporary highlighting marker for a merchandise price sign formed of a panel having a surface upon which at least one tag, made of a thin, flat, stiff, sheet material is placed in overlying, normally face to face contact with said surface, with the tag having pricing indicia imprinted thereon for display upon the panel, and with cooperating interlocking means formed on opposite ends of the tag and the panel areas which said ends overlie for fastening the tag upon the panel, and with the tag portion between said ends being free of securement to the panel, said marker comprising:

a strip formed of thin, flat, stiff sheet material with one end portion formed as a tongue, and its opposite end portion formed as a marking portion which extends laterally of the panel;

said tongue portion being narrower than the distance between the tag opposite ends and being of a width to closely fit between the opposite cooperating interlocking means, and between and in face to face contact with the tag and the panel surface portion which the tag overlies for being frictionally gripped therebetween;

and said tag marking portion having imprinted indicia thereon for providing a highlighting display adjacent the panel near the tag;

and with the marker being manually removeable and replaceable by manually grasping the marking portion and inserting and pulling out the tongue portion from between the tag and panel surface;

and wherein said interlocking means each comprise a raised pocket struck-out of the panel to provide a pair of opposed, aligned slots, with each slot receiving a tab integrally formed on the opposite ends of the tag;

and with the marker tongue portion having an integral shoulder portion for engaging a raised edge of one of the pockets for thereby holding the marker in pre-determined alignment with the panel.

4,372,067

DEVICE FOR FILING MISCELLANEOUS ITEMS OF INFORMATION

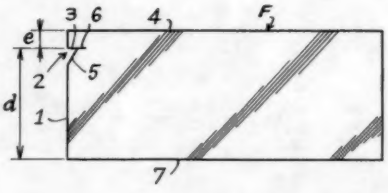
Paule Ruffino, 32, rue Waldeck Rousseau, Lyon, France (69006)

Filed Dec. 3, 1980, Ser. No. 212,482

Claims priority, application France, Dec. 4, 1979, 79 30166

Int. Cl.³ B42F *21/00*

U.S. Cl. 40—360 **12 Claims**



1. Apparatus for filing miscellaneous items of information comprising:

a plurality of cards, each having a horizontal lower side, a vertical side and a horizontal upper side, a notch on said vertical side and set back from said upper side, said notch being extended by an incision substantially parallel to said upper side; and

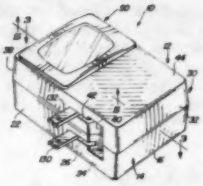
a support forming file having receiving means for cards said receiving means comprising a generally horizontal aperture means for engaging said notch and a slit extending from and communicating with said aperture means, said slit being inclined towards the lower part of said support forming file,

whereby said notch on said vertical side of each card engages the outer edge of said horizontal aperture of its respective receiving means and said lower side of each card engages the lower end of said slit extending from said aperture, when each card is supported in said file.

4,372,068
RECHARGEABLE TRANSPARENT SLIDE VIEWER APPARATUS

Paul A. Knapp, Tempe, Ariz., and Frederick A. Major, 1725 E. Ellis Dr., Tempe, Ariz. 85282, assignors to Frederick A. Major, Tempe, Ariz.

Filed Aug. 4, 1980, Ser. No. 174,737
Int. Cl.³ G02B 27/02, 27/04; G03B 21/20; G02B 7/02
U.S. Cl. 40—367 11 Claims



1. Apparatus for viewing a transparency having a front surface and an edge adjacent to the front surface, comprising, in combination:

housing means, including a recess;

a slot in the housing means for receiving the transparency for viewing;

a lamp in the housing means, remote from the slot and disposed adjacent to one end of the transparency when the transparency is received into the housing for viewing, for providing light to illuminate the transparency;

diffuser/reflector means disposed adjacent to the transparency and extending from adjacent to the lamp to adjacent to the slot for diffusing and reflecting the light from the lamp to the transparency;

electrical means for providing an electric current to the lamp, including

a rechargeable battery disposed within the housing means,

a pair of plug contacts disposed in the recess of the housing means connected to the rechargeable battery and pivotable out of the recess and the housing means and insertable into an electrical outlet for recharging the rechargeable battery;

switch means connected to the electrical means including a cam portion movable laterally sideways by the front surface of the transparency adjacent to the edge for selectively connecting the electrical current to the lamp and for maintaining the connection of the electrical current to the lamp until the transparency is removed from the slot; and

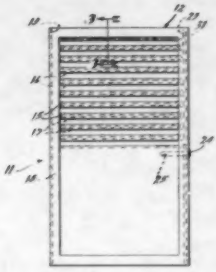
lens means disposed adjacent to the transparency and including a lens for viewing the transparency.

4,372,069
IDENTIFICATION DEVICE

Oliver C. Griffith, 138 Shore Rush Dr., St. Simons Island, Ga. 31522

Filed Nov. 17, 1980, Ser. No. 207,475
Int. Cl.³ G09F 11/00
U.S. Cl. 40—490 2 Claims

1. An identification device for assisting an individual in retaining a plurality of bits of information comprising a body portion of a size that may be conveniently carried on the person, said body portion being a laminated construction comprised of a substantially imperforate center member having a generally rectangular shape, and a plurality of transversely extending members affixed to opposite sides of said center member, said transversely extending members and said center members defining a plurality of inverted "T" shaped slots extending across opposite faces of said body portion, the cross legs thereof forming a plurality of independent recesses in said body portion adapted to receive parts formed with indicia for displaying the bits of information, means for permitting the user to see the indicia on the pieces when received in said recesses comprising the upstanding legs of said "T" shaped slots, means providing a fixed closure for one end of said inverted "T" shaped slots affixed to said center member and said transversely extending members, and retention means providing a closure for the other end of said "T" shaped slots, release of said retention means being effective to permit parts



to be inserted or removed from a selected one of said recesses without necessitating removal of parts from the remainder of the recesses, said retention means comprising an elongated member having a cross-section of one of its ends of a configuration complimentary to the inverted "T" shaped slots for facilitating insertion of the pieces therein.

4,372,070
ADHESIVE SIGN AND METHOD OF MAKING

Egon Erlich, 701 Ocean Ave. #10, Santa Monica, Calif. 90402

Filed May 26, 1981, Ser. No. 266,913
Int. Cl.³ G09F 7/16
U.S. Cl. 40—595 14 Claims

1. An adhesive sign comprising:

a material having a plurality of characters representing a sign cut into the material, said characters remaining in the material;

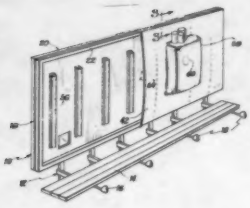
an adhesive covering substantially the entire top of the material, excluding the areas forming the characters;

a top covering sheet co-extensive with the top surface area of said material;

an adhesive on the bottom of said material; said adhesive material limited only to the areas forming said characters;

a bottom covering sheet means on the bottom of said material coextensive with the surface area of said material.

4,372,071
FABRIC FACED BILLBOARD
Robert K. Vicino, 8847 Complex Dr., San Diego, Calif. 92123
Filed Sep. 14, 1981, Ser. No. 301,548
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—624 **15 Claims**

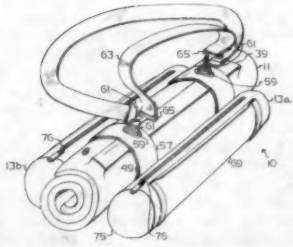


1. A display comprising:
(a) a flexible sheet defining a message-carrying surface;
(b) a support frame and means for mounting said sheet substantially continuously around its periphery to said frame;
(c) backing means comprising a rigid planar back board panel of a billboard behind said sheet and together with said sheet defining a substantially enclosed chamber;
(d) means for introducing air into said chamber on an ongoing basis at a pressure higher than ambient to billow said sheet away from said backing to tauten same so that said message-carrying surface is generally smooothly deployed and substantially free of surface discontinuities resulting from such effects as sagging, stretching and wind ripple; and
(e) said support frame including means supporting said billboard upright over a ground surface.

4,372,072
FISHING ROD HOLDER HAVING DUAL MOUNTING CAPABILITIES
Joseph E. Comeau, 18 State Park Dr., Titusville, N.J. 08560
Filed Feb. 23, 1981, Ser. No. 236,737
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 **7 Claims**

1. The combination of a fishing rod holder adapted to be inserted into the ground, and a bracket for mounting said holder to a vehicle bumper, the fishing rod being of the type having a reel secured to the handle end of said rod and having a fishing line carrying a sinker attached thereto, said holder comprising;
a longitudinal tubular member symmetrically disposed about a main axis of a given diameter having an open top for accommodating the handle portion of a fishing rod, and a closed bottom end, with a slot extending from the periphery of said open top and directed relatively parallel to the main axis of said tubular member, with said slot adapted to accommodate the reel of said rod, an elongated spike member depending from said bottom end and having a relatively pointed termination remote from said bottom end, an anchor plate member secured between said tubular member and said spike member at a predetermined distance above said pointed termination, said bracket comprising;
a central section with integral extending top and bottom arms for coacting with the top and bottom portions of a bumper for securing the same thereto, and having a spike accommodating means secured to said central section for accommodating said elongated spike, a sinker securing means coupled to said bracket for accommodating a sinker secured to said fishing line whereby when said handle of said rod is emplaced in said rod holder and said elongated spike is emplaced in said bracket said sinker securing means accommodates said sinker to exert a force via said line to firmly hold said rod holder and said rod in position on said bumper.

4,372,073
FISHING TACKLE STORAGE APPARATUS
Sidney M. Goldman, 401 Webster, Chicago, Ill. 60614
Filed Jul. 29, 1981, Ser. No. 288,064
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—57.1 **11 Claims**



1. A fishing tackle storage apparatus comprising a primary storage apparatus including a lure mounting pad made from a foamed elastomeric material adapted for detachably receiving the hooks of a hook-type fishing lure, said foamed elastomeric flotation material having a closed cell structure substantially impenetrable to water so that its buoyancy is retained even when in contact with water for an extended period of time, a protective cover flap substantially resistant to hook penetration adapted to cover the lure mounting pad and associated hooks and being rollable with the lure mounting pad into a compact, generally cylindrical shape, a pliable and rollable backing secured to said lure mounting pad so as to overlie the surface thereof opposite the surface covered by said protective cover, fastener means mounted on said primary storage apparatus so as to project outwardly therefrom when said apparatus is in the form of a generally cylindrical shape, and including two substantially cylindrical shaped auxiliary tackle receptacles having clasp means thereon adapted for releasable attachment, in saddlebag fashion, to said fastener means on said primary storage apparatus when said primary storage apparatus is rolled into a generally cylindrical shape.

4,372,074
ANIMAL TRAP
Pierre Arrabit, 631 20th Ave., San Francisco, Calif. 94121
Filed Oct. 20, 1980, Ser. No. 198,691
Int. Cl.³ A01M *23/04*
U.S. Cl. 43—69 **11 Claims**

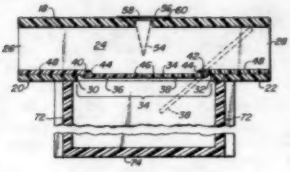
1. An animal trap adapted to be located on a ground surface and exterior of a building and in adjoining relation to a vertical wall of said building, comprising:
a receptacle having an animal receiving chamber, a pair of vertically extending side walls, front and end walls con-

necting said side walls and a bottom, said walls and bottom being substantially water impervious, said receptacle having an open top providing an entry to said chamber;

an elongate, tubular housing mounted to said receptacle and covering said entry, said housing having wall portions defining a pair opposed openings and a top, a passage extending between said openings, a first aperture for communication between said passage and said animal receiving chamber, and a second aperture formed in said top in generally opposed relation to the first aperture;

bait receiving means mounted in said passage and in communicating relation to the second aperture to allow bait to be received by said bait receiving means through said second aperture;

a cover member moveably attached to said housing for removeably covering the second aperture, the cover member extending past the periphery of said second aperture, the lateral edges of the cover member extending



downwardly past the second aperture to provide water resistant protection for said second aperture;

a pair of spaced apart grooves formed in the outer surface of the top of the housing, said grooves extending transverse said housing, at least a portion of each of said grooves underlying at least a portion of the longitudinal edges of said cover member to help prevent water from entering said second aperture;

a pair of substantially coplaner door members pivotedly mounted in horizontal end-to-end relation in said passage, said door members having interior end portions extending toward one another and being moveable from a first position overlying and covering said aperture to a second position extending through said aperture and said entry and into said chamber; and

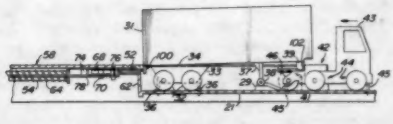
means attached to said housing and configured to conformably mate with said edge portions of said receptacle, said edge portions being correspondingly configured to produce a water resistant seal therebetween.

4,372,075

APPARATUS FOR COUPLING AND UNCOUPLING TOY TRACTORS AND SEMITRAILERS

Samuel J. Harkins, Maple Shade, N.J., assignor to Tyco Industries, Inc., Moorestown, N.J.

Filed Mar. 20, 1981, Ser. No. 245,866
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—1 K **10 Claims**



1. Apparatus for coupling a toy semitrailer and a toy tractor which ride on a roadway, wherein the semitrailer is provided with dolly wheels and a depending pin forward of the dolly wheels and the tractor is provided with a recess within which the semitrailer pin can be seated, comprising:

(a) a ramp in said roadway having an inclined portion and a flat portion;

(b) reciprocable means adapted for a movement between a fully retracted position with respect to the ramp and a fully extended position with respect to the ramp, said fully extended position being located between said fully retracted position and said ramp;

(c) means for automatically presetting and releasably retaining said reciprocable means in a partially extended position intermediate the fully retracted and fully extended positions such that the semitrailer dolly wheels rest on the flat portion of the ramp and the semitrailer pin is elevated with respect to the tractor recess;

(d) said reciprocable means being adapted to be contacted and displaced by said semitrailer from said partially extended position to said fully retracted position such that the dolly wheels remain on the flat portion of the ramp;

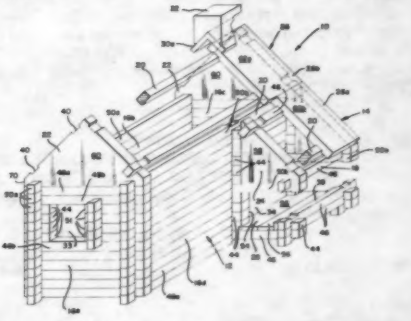
(e) means for urging said reciprocable means from said fully retracted position past said partially extended position to said fully extended position to cause said reciprocable means to contact the semitrailer and move the semitrailer such that the dolly wheels ride off the flat portion of the ramp onto the inclined portion of the ramp whereby the forward end of the semitrailer pivots downwardly and the semitrailer pin enters the tractor recess.

4,372,076

MODULAR INTERLOCKING BLOCK CONSTRUCTION TOY

Harald Beck, 15 Croxton Ave., Oakland, Calif. 94611

Filed Jun. 18, 1979, Ser. No. 49,152
Int. Cl.³ A63H *33/08*
U.S. Cl. 46—20 **8 Claims**



1. A modular interlocking block construction toy comprising:

a plurality of elongated logs of substantially uniform cross section forming a set, each log having opposed notches for interconnecting said logs by mutually interfacing of notches of separate logs to form relatively rigid structures, wherein a first plurality of said logs in said set have at least two pairs of notches spaced apart by a first primary dimension, and a second plurality of said logs in said set have at least two pairs of notches spaced apart by a second primary dimension;

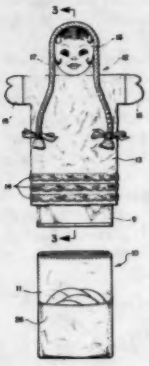
a plurality of flats formed of flat block pieces having notches spaced for cooperation with said logs, wherein said flats include a key gable flat defining said primary dimensions, said gable flat having a triangular configuration with a bottom edge and two equal side edges at an acute angle to said bottom edge, said bottom edge having two spaced notches spaced apart a distance comprising said second primary dimension and said side edges each having two spaced notches spaced apart a distance comprising said

first primary dimension wherein said second primary dimension is greater than said first primary dimension.

4,372,077
COMBINED BOOK, FLANNELBOARD AND HAND PUPPET

Dora O. Balbuena, 799 Larkspur Dr., Sandy, Utah 84070

Filed Jul. 1, 1981, Ser. No. 279,303
Int. Cl.³ A63H *3/14*; G09B *1/02*
U.S. Cl. 46—116 **9 Claims**



1. An amusement device comprising in combination as part of a merchandisable packet, a storybook; a flannel board; flannel board figures, said figures including characters or scenes taken from the storybook story and printed on a material adapted to hold in place when placed on the flannel board; and a hand puppet adapted to be manipulated by a hand and having a storage pocket therein to receive said storybook, flannel board, and figures for storage, said puppet being a likeness of one of the characters in the story.

4,372,078
TOY MOVABLE BY ALTERNATELY RELOCATING INDIVIDUAL MEMBERS OF A PAIR OF BODY PARTS

Gorden W. Spring, Norwalk, Calif., assignor to Tomy Corporation, Carson, Calif.

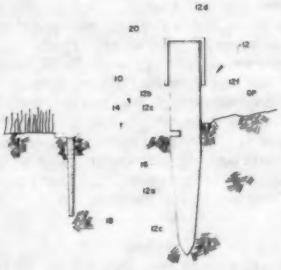
Filed Nov. 13, 1980, Ser. No. 206,345
Int. Cl.³ A63H *11/00*
U.S. Cl. 46—150 **23 Claims**

1. A toy which comprises:
a first body and a second body associated with each other;
a crank means extending transversely between said first and said second bodies and rotatably connected to both of said first and said second bodies, said crank means forming the only connection between said first and said second bodies, said crank means having ends with one end terminating within said first body and the other end terminating within said second body;
means for rotating one end of said crank so as to operate said toy, during the operation of said toy said first and said second bodies moving on a support surface with respect to one another about said crank means, said movement sequentially comprising first having both of said bodies located on said support surface with said first body longitudinally displaced in a starting position with respect to said second body, secondly said second body moving through a pathway until said second body is repositioned on said support surface longitudinally with respect to said first body and thirdly said first body moving through a pathway until said first body is repositioned longitudinally with respect to said second body to locate said first and said second bodies in said starting position;
each of said first and said second bodies including a surface engagement means associated with it and capable of engaging said support surface, one of said engagement means of one of said first and said second bodies engaging said support surface as said first body moves in its pathway and the other of said engagement means of said first and said second bodies engaging said support surface as said second body moves in its pathway, said one of said surface engagement means which engages said surface as said first body moves in its pathway capable of impeding said second body from moving with respect to said support surface as said first body moves in its pathway, the other of said surface engagement means which engages with said surface as said second body moves in its pathway being capable of impeding said first body from moving with respect to said surface as said second body moves in its pathway.

4,372,079
GARDEN EDGING STRUCTURE

Ann S. Trageser, 114 Belvedere Sound View Dr., Hampstead, N.C. 28443

Filed Jan. 22, 1981, Ser. No. 227,184
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—33 **3 Claims**



1. A garden edging structure for generally surrounding an enclosing a garden plot comprising: an inner closed border structure for enclosing and extending around a garden plot; said inner border structure including a series of ground penetrating border member having a first underground portion that is adapted to extend into the ground and to generally anchor said inner border structure about said garden plot and a second portion extending above ground level and generally surrounding said garden plot, said inner border structure further including a series of elongated ground penetrating members of selected length, and wherein there is provided a U-shaped connecting means adapted to be capped in inverted fashion over and about respective joints defined between successive ground penetrating members comprising said inner boundary structure; and wherein said ground penetrating members of said inner border structure in transverse cross section comprises an elongated member extending into the ground with a lower tapered ground penetrating end and a generally rectangularly

shaped upper portion with a flat top exposed surface extending above ground level; a generally planar horizontally extending outer border structure disposed outwardly and adjacent said inner border structure and extending generally around said garden plot outwardly of said inner border structure, said outer border structure including an elongated, relatively thin strip of material comprising a segment of vinyl material with an ornamental surface provided about the top thereof; joining means for allowing said outer border structure to join said inner border structure to form a continuous border around said garden plot, said joining means including a slot formed along the outer side of said inner border structure with said slot having a depth at least equal to the thickness of said outer border strip material for receiving the same, and wherein said slot is formed intermediately along the height of said inner border structure such that said slot lies generally at ground level; and anchoring means engaged with said outer border structure for penetrating into the earth surrounding said garden plot to anchor said outer border structure about said garden plot.

4,372,080

TREATED PEANUT SEEDS

Kyle W. Rushing, Plano, Tex., assignor to Gustafson, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 111,726, Jan. 14, 1980, Pat. No. 4,339,456. This application Mar. 17, 1981, Ser. No. 244,765
Int. Cl.³ A01C *1/06*
U.S. Cl. 47—57.6 **7 Claims**

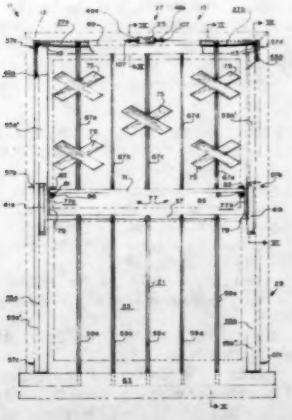
1. Treated peanut seeds comprising peanut seeds with the testa intact on the cotyledons, and a coating for treating the seeds applied onto the testa, the coating being produced by treating the seeds with a colloidal suspension including oil as a base and also including micronized seed treating active chemicals carried by the oil in the suspension, the suspension being applied to the peanut seeds at a rate in the range of 6 to 16 fluid ounces per hundred weight of peanut seeds, and the seeds being allowed to dry with the result that the coating including active chemicals remains on the seeds whereby they minimize chemical dust related environmental and physical problems.

4,372,081

HEAT RELEASABLE WINDOW GUARD

Joseph Forgione, 6145 Highway 51 North, Millington, Tenn. 38053

Filed May 18, 1981, Ser. No. 264,686
Int. Cl.³ E05F *15/20*
U.S. Cl. 49—8 **7 Claims**



1. Window guard means for providing a degree of security against an intruder gaining entrance into a dwelling through the usual window structure of the type including a window frame having a generally horizontal top frame structure and generally vertical first and second side frame structures coupled to opposite ends of said top frame structure, said window guard means comprising:

(a) anti-intrusion bar means disposed on the interior side of said window structure and in proximity thereto, said anti-intrusion bar means including a movable portion for being situated for vertical slidable movement between a normally UP position in which at least a comparable portion of said window structure is adequately guarded therewith and a DOWN position in which an escape route through said window structure is provided the inhabitants of the dwelling in the event of fire, said movable portion including a support member having a first end and a second end; and

(b) support means for normally supporting said movable portion of said anti-intrusion bar means in said UP position, said support means including a fusible link means for being attached to said top frame structure of said window frame substantially intermediate said first and second side frame structures, including a first latchstring member having a first end for being attached to said fusible link means and having a second end, including a first latch member attached to said second end of said first latchstring member for normally engaging said first end of said support member of said movable portion of said anti-intrusion bar means, said first latchstring member extending from said fusible link means along said top frame structure and down said first side frame structure, including a second latchstring member having a first end for being attached to said fusible link means and having a second end, and including a second latch member attached to said second end of said second latchstring member for normally engaging said second end of said support member of said movable portion of said anti-intrusion bar means, said second latchstring member extending from said fusible link means along said top frame structure and down said second side frame structure, said fusible link means releasing said latchstring members when exposed to a predetermined degree of heat, thus enabling gravitational movement of said movable portion of said anti-intrusion bar means from said UP position thereof to said DOWN position thereof in the event a fire breaks out within the dwelling, thereby, the fire escape route being automatically provided while denying the intruder the convenience of utilizing said window structure for gaining unwarranted entrance into the dwelling.

4,372,082

STORM WINDOW UNIT HAVING EXPANDABLE FRAME

Gary A. Pagel, 10107 NE. 37th St., Vancouver, Wash. 98662

Filed Feb. 18, 1981, Ser. No. 235,593
Int. Cl.³ E05B *65/04*
U.S. Cl. 49—62 **4 Claims**

1. An adjustable window unit, comprising:

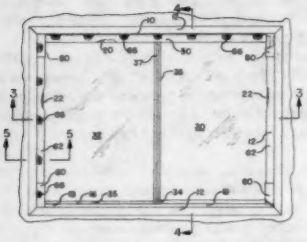
(a) an inner frame having a plurality of inner frame members interconnected to define frame corners, said inner frame members including a horizontally disposed head member and a pair of vertically disposed jamb members;

(b) a respective expander cap member having a pair of opposite ends, said expander cap member comprising an elongate channel of generally U-shaped cross-section including a base portion and a pair of parallel flange portions, disposed along at least one of said inner frame head and jamb members, each expander cap associated with one of said inner frame jamb members defining a central groove on a peripheral side thereof;

(c) frame expansion means associated with said window unit for adjustably moving each said expander cap member outwardly relative to the respective inner frame member,

for mounting said window unit within a window casing; and

(d) corner cap means, fitted over a respective end of at least one of said expander cap members and extending around a respective corner of said inner frame for closing a gap located between said window casing and said end of said expander cap member, said corner cap means comprising



an elongate generally U-shaped channel portion, disposed about one of said expander cap members, tab means, disposed generally perpendicular to the length of said channel portion, for extending along another member of said window unit and holding said corner cap in position, and a rib portion located within said generally U-shaped channel portion and adapted to fit within said central groove.

4,372,083

PLIABLE EDGE PROTECTOR

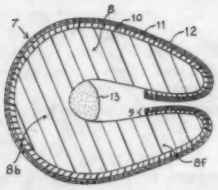
Christopher Hatzikelis, R.R. 1, Palgrave, Ontario; Ciro Madonia, 1390 Beaufort Dr., Burlington, Ontario, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, all of Canada

Continuation of Ser. No. 85,294, Oct. 16, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,589

Claims priority, application Canada, Mar. 26, 1979, 324112

Int. Cl.³ E05F 7/00

U.S. Cl. 49—462 **9 Claims**



1. A pliable edge protector comprising;

(a) an elongated extruded homogeneous channelar member formed solely of plastic pliable material, said member having a bight portion and a pair of opposed flange portions extending therefrom in mutually convergent relation to form a restricted entry suitable in use to receive an automobile door edge in readily penetrating relation therebetween;

(b) a decorative film comprising a pliable film strip having a major surface thereof bonded in adhering relation to the outer surface of said channelar member, a solely decorative metallic film deposited on the exterior of said film strip; and a weather resistant film deposited on the exterior surface of said metallic film in overlying protective relation therewith and extending within said said entry to locate the edges of said metallic film in protected, non-exposed relation between said flange portions, and

(c) a bead of pressure sensitive adhesive disposed within said bight portion and protected prior to assembly with said edge soley by said flange portions to provide substantially non-kinking, substantially non-degradable pliable protector.

4,372,084

DEVICE FOR SEALING A WING OF A WINDOW, A DOOR OR THE LIKE IN RELATION TO A FRAME ASSOCIATED THEREWITH

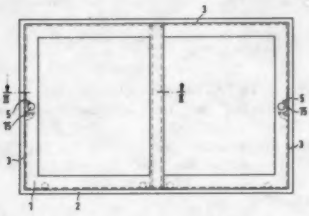
Bernhard Janke, Bindlach, Fed. Rep. of Germany, assignor to HEF Technische Entwicklung GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,626

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938193

Int. Cl.³ E06B 7/16

U.S. Cl. 49—477 **8 Claims**



1. A device for sealing a wing of a window, a door or the like in relation to a frame associated therewith, said device including a sealing tube which is adapted to be expanded by liquid pressure and including closing means adapted to lock said wing in said frame, said device comprising:

a diaphragm-type pump for producing said liquid pressure,

an independent supply reservoir for the liquid to be pressurized, said liquid reservoir being connected to said pump,

a first valve for actuation by said closing means connecting said liquid reservoir to said sealing tube, and

a second valve between said pump and said sealing tube, and opening towards said sealing tube,

said diaphragm-type pump comprising:

a pot-like base member,

a diaphragm closing said base member, and

an upper member attached to said diaphragm, said upper member supporting a rotatable element,

said upper member being provided with pegs and is slidably guided in slots of a guide sleeve, said slots extending at right angles to the plane of said diaphragm,

said rotatable element having a plurality of sawtooth-shaped cam elements which rest on said pegs, and being rotatably mounted in relation to said upper member.

4,372,085

APPARATUS FOR FORM-GRINDING THE TOOTH-FLANKS OF A CYLINDRICAL GEARWHEEL

Dieter Wiener, Ettlingen; Gerd Sulzer, Wiggensbach-Simmlers, both of Fed. Rep. of Germany; Rudolf Skyba, deceased, late of Haldenwang-Börwang, Fed. Rep. of Germany (by Dorothea Skyba, legal representative), and Jürgen Pomp, Kempten, Fed. Rep. of Germany, assignors to Liebherr-Verzahntechnik GmbH, Kempten, Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,466

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855857

Int. Cl.³ B24B 47/26, 1/00; B23F 1/02

U.S. Cl. 51—216 ND **1 Claim**

1. Apparatus for use in producing spur cylindrical or helical cylindrical gearwheels by form-grinding the flanks of the gear teeth with a grinding wheel having a profile of the tooth space between adjacent teeth of the gearwheel, the grinding wheel

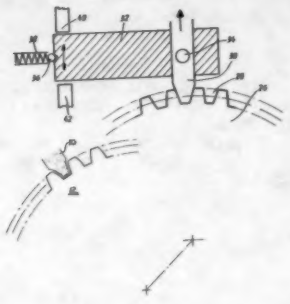
initially being simultaneously applied to both flanks of a given gear tooth and thereafter being separately applied to each of the flanks, said apparatus comprising:

a rotatable indexing wheel (26) couplable to the gearwheel (12) generally coaxially therewith, said indexing wheel having cutouts (28) equal in number to the tooth number desired on the gearwheel;

indexing pawl means operatively associated with said indexing wheel and including,

an indexing nose (30) radially movable into and out of engagement with said cutouts of said indexing wheel,

a lever (32) positioned generally tangentially with respect to said indexing wheel, said lever having an end receiving said indexing nose and pivoted at a point radially beyond



the point of engagement of said indexing nose and indexing wheel, said lever having a free end arcuately movable for reciprocally rotating the indexing wheel and gearwheel to separately apply the grinding wheel to each flank of the gear tooth,

a pair of adjustable stops (40, 42) operatively associated with the free end of said lever for limiting the arcuate movement of said free end of said lever and of said indexing nose for defining the amount of rotation of said indexing wheel and gearwheel; and

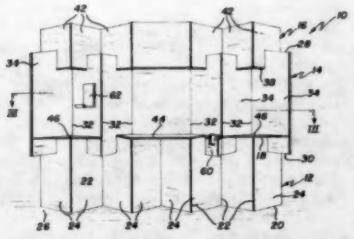
means (36, 38) for releasably retaining said lever in a central position intermediate the limits of arcuate movement of said free end in which the indexing wheel positions the gearwheel for simultaneous application of the grinding wheel to both flanks of the gear tooth.

4,372,086

DISPLAY

Albert W. Hanlon, Boylston, Mass., assignor to Admore, Inc., St. Shrewsbury, Mass.

Filed Apr. 6, 1981, Ser. No. 251,329
Int. Cl.³ A47B 5/00
U.S. Cl. 52—36 8 Claims



1. A display construction comprising:

(a) a first vertical display panel of light-weight sheet material having a top edge, a bottom edge, and a plurality of vertical folds that divide the panel into a plurality of first planar sections so that the said top and bottom edges extend in a zig-zag pattern that enables the panel to be supported on a flat surface along its bottom edge at least some of said planar sections each having a vertical slot that extends downwardly from the top edge,

(b) a second vertical panel of light-weight sheet material having a top edge and a bottom edge, said second panel having a plurality of vertical folds that divide the second panel into a plurality of second planar sections so that the top and bottom edges of said second panel each extend in a zig-zag pattern, at least some of the second planar sections each having a vertical slot that extends upwardly from the bottom edge of said second panel, the notches of the first and second panels being vertically aligned for securing the panels in an interlocking relation so that the first and second sections are in different vertical planes, said second panel having an aperture slot which is located above the top edge of the first panel,

(c) a horizontal shelf having a tab which extends through the aperture in the second panel and which is supported on the top edge of the first panel, and

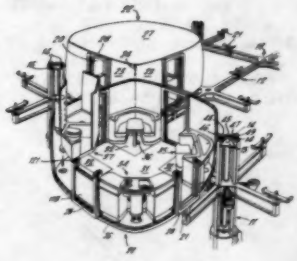
(d) means for locking the tab against horizontal movement.

4,372,087

MODULAR BUILDING STRUCTURES

Ernest J. Kump, 56 Curzon St., Mayfair, London W1Y 7PF, England

Filed Jan. 12, 1980, Ser. No. 272,456
Int. Cl.³ E04B 1/348; E04H 1/00; E04B 1/34
U.S. Cl. 52—79.12 11 Claims



1. A modular building structure comprising a support structure including a plurality of spaced vertical columns, horizonal beams interconnected between columns to form a rigid support system, and at least one space module structurally defining an enclosed volume of space and adapted to be removably supported from said support structure, in which there are provided utility conduits integrated with at least some of said columns and connectable at their lower ends to utility inlets and outlets, column manifold means at a plurality of levels in each of the said some vertical columns, said manifold means having connections to the said utility conduits, module manifold means in at least some of said space modules having connections to utility conduits within the modules and coupling members each having conduits for the utilities and means for connection to both a column manifold means and a module manifold means said connection means being constructed and arranged so that connection of the coupling member with a manifold means in a column and a module connects together the utility conduits in the module and the volumn via the conduits in the coupling member.

4,372,088

STRUCTURE WITH SLAB BEAMS

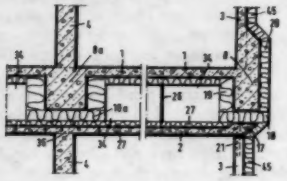
Claus Cichos, Wehrheim, Fed. Rep. of Germany, assignor to Bärbel Cichos, Wehrheim, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 219,167

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2908995

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—251 10 Claims



1. A structure comprising

at least one horizontal slab beam having a steel beam and a concrete slab;

a pair of vertical slab beams disposed in vertically spaced relation to each other to define an outer wall, each vertical slab beam having a steel beam and a concrete slab; and

a poured-in-place concrete beam having reinforcing steel therein connecting said steel beam of said horizontal slab beam to each said steel beam of said vertical slab beams, said poured-in-place concrete beam being spaced above said concrete slab of the lower one of said vertical slabs and being in unreinforced contact with said concrete slab of said horizontal beam and said concrete slab of the other of said vertical slabs.

4,372,089

ENERGY SAVING BUILDING AND METHOD OF MAKING SAME

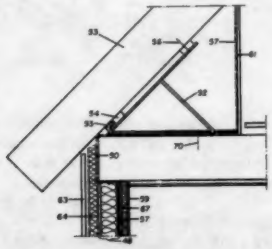
Knut V. Akesson, Dalsberga gard, Fack 35, S-775 01 Krylbo, Sweden

Filed Apr. 7, 1980, Ser. No. 137,777

Claims priority, application Sweden, Apr. 6, 1979, 7903109; Dec. 20, 1979, 7910567

Int. Cl.³ E04B *1/78*

U.S. Cl. 52—404 19 Claims



1. Tight and energy saving building, comprising:

a first level having a floor as the lower surface thereof and upwardly extending walls;

a second level above said first level and separated from the first level by an intermediate floor structure (51) and having generally upwardly extending members extending upwardly from said intermediate floor structure;

said intermediate floor structure being jointed to said walls of said first level and to said upwardly extending members of said second level;

an upper structure extending over said second level;

thermal insulation material in said floor, in the walls of said first level, in said upwardly extending members of said second level and in said upper structure;

an integral airtight vapor barrier (57) interior (with respect to the building) of a major part of the thermal insulation material in the floor and walls of the first level;

an integral airtight vapor barrier (57) interior (with respect to the building) of a major part of the thermal insulation material in the upper structure and in the walls of the second level; and

an airtight layer (50) that extends through the joints between said intermediate floor structure and the walls of said first level and the upwardly extending members of said second level, said airtight layer (50) extending around the outer periphery of said intermediate floor structure;

said two airtight vapor barriers (57, 57) being sealingly united with said airtight layer (50).

4,372,090

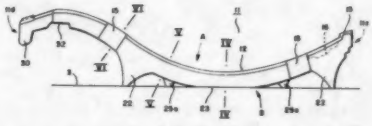
STRUCTURE FOR ROOFING TILE

Kojiro Shichijo, 2-3-45-731 Tsurumi, Tsurumi-ku, Yokohama, Kanagawa, Japan

Filed Oct. 20, 1981, Ser. No. 313,323

Int. Cl.³ E04D *1/00*; B32B *3/30*

U.S. Cl. 52—536 3 Claims



1. A roofing tile which is generally rectangular in plan view and S-shaped in cross-section, said tile comprising:

an upwardly projecting, lateral, top end flange provided on a top surface of said tile;

at least one engagement recess provided in said top end and said top end flange;

at least a pair of stabilizing pawls provided on a bottom surface of said tile adjacent said top end, each of said stabilizing pawls provided on each side of a trough of said S-shaped cross-section, said stabilizing pawls for engaging with a surface of a roofing tile support;

a plurality of first longitudinal ribs provided on said bottom surface of said tile adjacent said top end of said tile for engaging with said surface of said roofing tile support and for reinforcing said tile;

a plurality of second longitudinal ribs provided on said bottom surface of said tile adjacent a bottom end of said tile for reinforcing said tile;

a lateral rib provided on said bottom surface of said tile adjacent said bottom end, said lateral rib for engaging with an upwardly projecting, lateral, top end flange of a subjacent tile;

at least one projection provided on said lateral rib, said projection for engaging with an engaging recess of said subjacent tile;

a first longitudinal groove provided in said top surface of said tile adjacent one edge of said tile;

a first longitudinal, upwardly projecting flange provided adjacent said first longitudinal groove;

a second longitudinal groove provided in a bottom surface of said tile adjacent another edge of said tile for engaging with a first longitudinal, upwardly projecting flange provided on an adjacent tile;

a second longitudinal, downwardly projecting flange provided on said bottom surface adjacent said second longitudinal groove, said second longitudinal, downwardly projecting flange for engaging with a first longitudinal groove provided in said adjacent tile; and

a stepped surface provided along and between said bottom end and a lateral rib of said subjacent tile;

whereby said tile may be installed without utilizing cross-pieces.

4,372,091

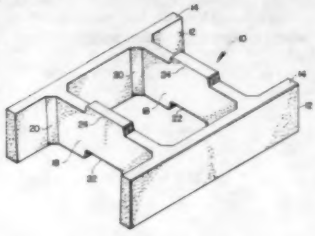
PRECAST CONCRETE STRUCTURAL UNIT AND COMPOSITE WALL STRUCTURE

William L. Brown, Avon, Conn., and Roger L. Toffolon, 1060 Prospect Ave., Hartford, Conn. 06105, assignors to Atlantic Pipe Corporation, Plainville, Conn. and Roger L. Toffolon, Stuart, Fla.

Continuation-in-part of Ser. No. 968,476, Dec. 11, 1978, abandoned. This application Nov. 4, 1980, Ser. No. 204,327

Int. Cl.³ E04C 1/10

U.S. Cl. 52—593 59 Claims



1. A concrete structural unit for use in construction of walls and the like in vertically stacked horizontal row relationship with other similar units; said unit comprising a pair of laterally spaced longitudinally extending and vertically disposed side panels each of a generally rectangular configuration viewed laterally and each of a generally rectangular cross-sectional configuration, and said panels cooperatively defining a vertically exposed generally rectangular space therebetween, a pair of vertically disposed generally rectangular and laterally extending connecting arms disposed between said panels at respective inner surfaces thereof whereby to secure the panels in relatively fixed position, said arms being spaced longitudinally from each other and from the ends of the panels and each of said connecting arms including a top-bottom lateral interlock means comprising a disengageable mortise-tendon connection with a vertically recessed mortise and a complementary vertically projecting tendon arranged in vertically opposite relationship on the arm, said mortise-tendon interlock means including at least two complementary generally vertical bearing surfaces adapted for pressure engagement, and said bottom lateral interlock means on each connecting arm serving cooperatively with top interlock means on a connecting arm of an immediately sub-adjacent unit for laterally interlocking the two units when the units are superimposed, said interlock means being gravity dependent but physically positive laterally with respective generally vertical complementary bearing surfaces of the bottom and top interlock means of the superimposed units in pressure engagement, and each said mortise and tendon having a width less than three-fourths (3/4) the total width of the structural unit whereby said bearing surfaces are spaced substantially laterally inwardly from the side panels toward the center of the connecting arm, and the longitudinal spacing between connecting arms being approximately twice the longitudinal spacing of each arm from the adjacent end of the side panels, the said units thus being adapted for vertical alignment and lateral interlocking of alternate connecting arms when the units are stacked vertically in horizontally staggered rows with the horizontal displacement between units in vertically adjacent rows approximately one-half the length of a unit.

4,372,092

PRECAST CONCRETE MODULAR BUILDING PANEL

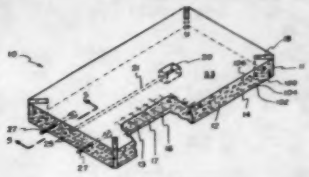
Fred T. Lopez, 1772 22nd St., Ogden, Utah 84401

Continuation of Ser. No. 714,919, Aug. 16, 1976, Pat. No. 4,259,824. This application Dec. 16, 1980, Ser. No. 216,858

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ E04B 5/04

U.S. Cl. 52—612 5 Claims



1. A structure at least partially of a concrete formulation comprising:

scoria, a suitable fibrous material, and pumice, the pumice being of a type having a microstructure substantial portions of which appear fiber-like under an electronic microscope, said type being found at least in the vicinity of Milford, Utah, Malad, Idaho, and Lava Hot Springs, Idaho, so that the scoria, the fibrous material and the pumice cooperate together in the concrete to render the concrete structurally strong and resistant to water.

4,372,093

TRUSS OF LATTICE TYPE

Axel B. R. Ericsson, Holmsund, Sweden, assignor to Frelens AB, Umea, Sweden

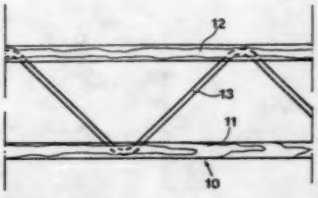
PCT No. PCT/SE79/00253, § 371 Date Aug. 8, 1980, § 102(e) Date Aug. 8, 1980, PCT Pub. No. WO80/01297, PCT Pub. Date Jun. 26, 1980

PCT Filed Dec. 18, 1979, Ser. No. 200,497

Claims priority, application Sweden, Dec. 19, 1978, 7813012; Feb. 28, 1979, 7901795

Int. Cl.³ E04C 2/24

U.S. Cl. 52—694 8 Claims



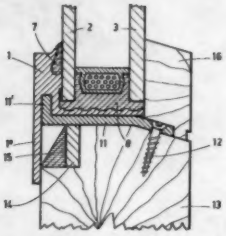
1. A truss of lattice type comprising an upper and a lower chord of wood material, a continuous web of steel in a generally zig zag configuration arranged between the chords and forming inclined struts, bent portions of the web being countersunk into recesses in the chords, said bent portions being fastened in the recesses by a hardening and binding substance which forms a layer replacing wood material removed to form the recesses, said substance having a strength at least equal to the strength of the wood material of said chords.

4,372,094

PROCESS FOR SIMPLE, RAPID AND ECONOMICAL TRANSFORMATION OF A WINDOW WITH A WOODEN OR METAL FRAME OR A SINGLE PANE FRAME INTO A WINDOW WITH A PLURALITY OF INSULATING PANES

Giovanni Boschetti, 6911 Vezio, Switzerland

Filed Jun. 23, 1980, Ser. No. 162,207
Claims priority, application Switzerland, Jun. 21, 1979, 5780/79; May 21, 1980, 3945/80
Int. Cl.³ E06B 1/14
U.S. Cl. 52—741 3 Claims



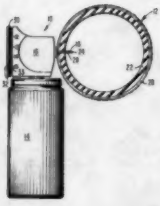
1. A process for double glazing openings in a building, comprising prefabricating a double glazed panel with two spaced sheets of glass and a frame having a trim strip and a recess between the trim strip and the frame, transporting the prefabricated glazed panel to a building having an opening to be double glazed, said opening having margins having exposed surfaces, inserting in the recess the upstanding flanges of brackets each of which has an upstanding flange, securing the brackets to the existing margins of said opening, said flanged brackets having end portions extending beyond said frame on the opposite side of said frame from said upstanding flanges, said brackets resting on the exposed surfaces of the margins of the frame, and passing fasteners through said end portions and into said existing margins of said opening.

4,372,095

TENNIS BALL PRESSURIZER

Allen De Satnick, 780 Boylston St., Prudential Ctr., No. 26F, Boston, Mass. 02199

Filed Feb. 23, 1976, Ser. No. 660,463
Int. Cl.³ B65B 31/08
U.S. Cl. 53—79 8 Claims



1. A tennis ball pressurizer comprising a hollow needle head having:

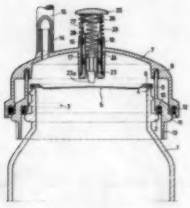
1. an internal bevel at a first end for forming a puncture hole in the tennis ball,
2. A bore portion extending from said first end for accommodating a plug cut from a tennis ball until the needle is removed from the ball,
3. a second end having a fitting for connection to a supply of gas having sufficient pressure for the interior of a tennis ball, and
4. means forming an orifice intermediate said ends, whereby
   (a) when said ball is punctured with said needle to dispose said first end and said orifice within said ball, said needle cuts the plug from the ball as it forms the puncture hole and retains the plug partially exposed beyond said first end, and gas entering said needle through said fitting end is vented into said ball through said orifice and
   (b) when said needle is withdrawn from said ball a partially exposed portion of said plug engages in and seals the puncture hole.

4,372,096

DEVICE FOR VACUUM SEALING OF PRESERVING JARS

Günter Baum, Auhofstrasse 24, 8051 Zurich, Switzerland

Filed Jun. 18, 1980, Ser. No. 160,488
Claims priority, application Switzerland, Jun. 23, 1979, 5839/79
Int. Cl.³ B65B 3/24; B67B 31/04
U.S. Cl. 53—88 5 Claims



1. A device for sealing preserving jars which are provided with a thin metallic essentially disc-like lid, the latter having on its rim a washer of an easily deformable material, the device comprising a hood which is put over the mouth of the jar loosely covered with said lid, and which hood fits tightly on the jar to form an enclosed chamber over said lid, means for connecting a vacuum source to said hood to create a vacuum in said chamber so that the air left within the jar escapes, and an externally manually operated valve means in said hood adapted to press said lid against said jar and then to let the atmospheric air stream into the chamber after evacuation of air has been finished, and only after the lid has been pressed with adequate power, tightly sealing against the top edge of the jar, said valve means being disposed at the center of said hood and comprising a guide tube extending through the hood and terminating in the neighborhood of the lid, a hollow valve cylinder which is closed at its top end slidingly disposed in said tube in sealing engagement and terminating at its lower end in a shoulder to engage the bottom of said tube and function as a stop to limit upward movement of said cylinder, said cylinder being normally biased in its uppermost position, a valve plug slidingly disposed in said cylinder and extending downwardly below said lower end, the outer wall of said plug being spaced from the inner wall of said cylinder to form a valve chamber, said plug being in sealing engagement with said lower end when the plug is in its lowermost position, and allowing communication between said enclosed chamber and said valve chamber when in a raised position, said plug being normally biased in its lowermost position, and inlet bores in said cylinder communicating said valve chamber with the atmosphere, whereby when external manual pressure is initially applied to said top end of said cylinder to provide a downward stroke thereto, first said downwardly extending plug contacts said lid to press the same against said jar, and when continued external manual pressure in an amount to overcome the biasing of said plug is applied to said top end of said cylinder, said stroke continues with concurrent relative movement between said

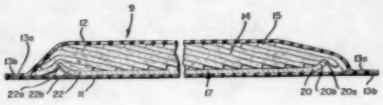
cylinder and said plug thereby causing communication between said enclosed chamber and the atmosphere via said valve chamber and said inlet bores.

4,372,097

METHOD OF MAKING AND FILLING A PACKAGE FOR SLICED COMMESTIBLE

Thor Wyslotsky, Alsip, Ill., assignor to TEC, Inc., Alsip, Ill.

Division of Ser. No. 81,647, Oct. 4, 1979, Pat. No. 4,268,530.
This application Oct. 10, 1980, Ser. No. 195,776
Int. Cl.³ B65B *11/50, 25/08*
U.S. Cl. 53—405 8 Claims



1. A method of producing a package of sliced commestible product, said method including the steps of:

providing a backing board formed from a sheet of planar material;

cutting the planar sheet into a generally rectangular shape with rounded corners having a smooth radius;

permanently deforming said rounded corners into upwardly projecting dispositions having a smooth radius;

slicing a commestible product and disposing the sliced commestible product into an overlapping array;

placing the overlapping array of sliced commestible product onto the backing board and covering the lateral edges and edges of the upwardly extending rounded corners of the backing board with said sliced commestible product, thereby to imbed the commestible product into the upwardly extending rounded corners; and

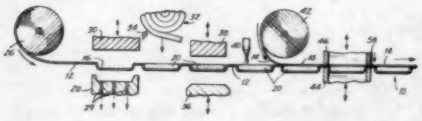
tightly enclosing the backing board and sliced commestible product borne thereon with a transparent film material.

4,372,098

METHOD OF MAKING AN APPLICATOR PACKAGE

Edwin W. Mason, Wyckoff, N.J., assignor to Mason Keller Corporation, Roseland, N.J.

Continuation-in-part of Ser. No. 85,813, Oct. 17, 1979, abandoned, which is a division of Ser. No. 639,961, Dec. 11, 1975, abandoned. This application May 5, 1981, Ser. No. 260,190
Int. Cl.³ B65B *5/02*
U.S. Cl. 53—412 10 Claims



1. A method of forming applicator packages, said method comprising the steps of:

feeding a first continuous web of material having multilaminated layers comprising at least a foil layer and a heat activatable layer from a supply roll, said material comprising an aluminum foil having an inner coating of a thermoplastic material, such as polyethylene;

forming successively a plurality of recesses along said first web of material;

depositing a fabric applicator pad into each of said recesses;

securing said fabric applicator to the inside portion of each said recess by means of heat sealing said pad to the thermoplastic polyethylene lining of said aluminum foil;

dispensing a predetermined quantity of product to each said applicator pad;

feeding a second continuous web of material having multilaminated layers comprising at least a foil layer and a heat activatable layer from a supply roll so as to be continuously aligned in a coextensive manner with said first web of material, said second web of material comprising an aluminum foil having an inner coating of a thermoplastic material, such as polyethylene;

simultaneously heat sealing the entire peripheral marginal edges of each applicator package so as to form a thermoplastic hermetic closure about all sides of said recess leaving at least one corner portion of said webs of material unsecured together;

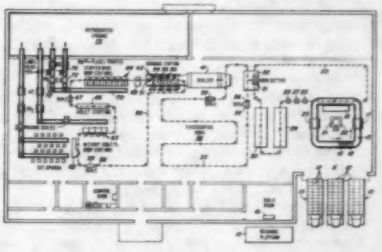
cutting off each said applicator package from said webs of material; and the thickness of any laminate layer is is from about 0.00035 to about 0.010 inch with said foil ranging from about 0.00035 to about 0.003 inch in thickness and said thermoplastic material ranging in thickness from about 0.0005 to about 0.002 inch.

4,372,099

METHOD OF PACKING POULTRY

Richard D. Linville, P.O. Box 7, Pleasant Valley, Iowa 52767

Filed Jan. 21, 1981, Ser. No. 227,142
Int. Cl.³ B65B *21/06;* A22C *21/00*
U.S. Cl. 53—415 3 Claims



1. A method of selecting from a number of birds having random weights a predetermined number of birds each having a weight within a predetermined weight range, comprising the steps of

individually weighing said birds,

selecting a first bird weighing within said range,

selecting a second bird weighing within said range and which weighs more than a predetermined reference weight within said range if the weight of said first bird is less than said reference weight or which is less than said predetermined reference weight if the weight of said first bird is more than said reference weight,

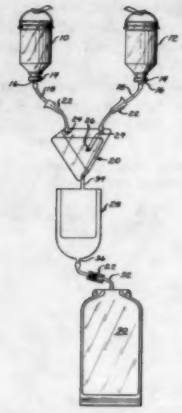
selecting another bird weighing within said range and which weighs more than said reference weight if the average weight of the previously selected birds is less than said reference weight or which is less than said reference weight if the said averge weight is more than said reference weight, and

repeating said last step until said predetermined number of birds have been selected.

4,372,100
PROCESS AND APPARATUS FOR COMPOUNDING HYPERALIMENTATION SOLUTIONS

Robert A. Miller, Crystal Lake, Ill.; Kenneth W. Larson, Keene, N.H., and Joseph L. Schopen, Crystal Lake, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 90,234, Nov. 1, 1979, abandoned. This application Dec. 17, 1981, Ser. No. 331,495
Int. Cl.³ B65B *3/06, 3/26*
U.S. Cl. 53—428 8 Claims



1. An apparatus useful for the sterile compounding of at least two solutions comprising:

a container for receiving the compounded solutions;

a mixing chamber in fluid-flow communication with the receiving container and with the source of each solution;

a filter interposed in the fluid-flow communication between the mixing chamber and receiving container for sterilizing the mixture after it is mixed in the chamber;

tubing connected between the filter and the receiving container for delivery of the sterilized mixture to the receiving container;

wherein the solutions may be delivered to the mixing chamber, mixed therein, delivered to the filter, and then delivered to the receiving container and wherein at least the sterilizing portion of the filter, the tubing, and the receiving container are a sterile unit; and

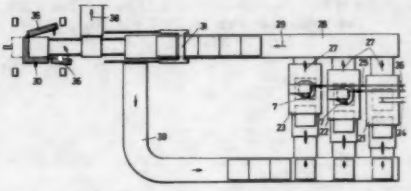
at least three uniform size tubes communicating with the mixing chamber for automatically controlling the quantity of each solution in the compounded mixture, each of said uniform size tubes being adapted for connection to a different solution source and through which the solution of the particular source can be delivered to the chamber, wherein the number of solution sources provided for a particular solution determines the quantity of that solution in the mixture.

4,372,101
APPARATUS AND PROCESS FOR PACKAGING SYNTHETIC FIBERS IN BALES

Hans Fleissner, Bettingerstr. 32, CH-4125 Riehen, Switzerland

Filed Feb. 8, 1980, Ser. No. 119,666
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906229
Int. Cl.³ B65B *1/24, 13/20*
U.S. Cl. 53—435 27 Claims

1. A process for forming synthetic fibers into bales by multistage compression, which comprises feeding synthetic fibers continuously to a plurality of depositing units; precompressing the fibers at the depositing units during deposition into a retaining bin positioned at each depositing unit to form a precompressed fiber parcel therein; transporting a plurality of the retaining bins containing the precompressed fiber parcels individually from each of the associated depositing units along first separate guide means to a first single guide means providing a single predetermined path extending from the separate guide means to a central press; then subjecting the fiber parcels

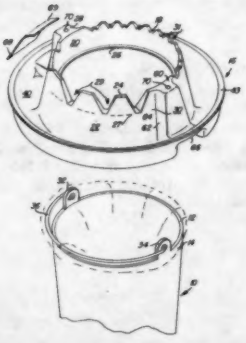


within the retaining bins, successively, to a finishing compression within said central press to form compacted bales; removing the compacted bales, successively, from the retaining bins and then transporting the empty retaining bins, successively, along a second single guide means back to second separate guide means operatively associated with each of the depositing units for returning empty retaining bins thereto.

4,372,102
METHOD AND APPARATUS FOR ENUMERATIVE DISPLAY AND DISPOSAL OF SURGICAL SPONGES

Rose M. McWilliams, 1065 S. Josephine, Denver, Colo. 80209

Continuation of Ser. No. 17,903, Mar. 5, 1979, Pat. No. 4,313,292. This application Dec. 11, 1980, Ser. No. 215,226
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.
Int. Cl.³ B65B *67/04, 67/12*
U.S. Cl. 53—474 5 Claims



1. A method for verifying count and amount of fluid collected in used surgical sponges, said method comprising:

providing a single collection bag for ultimate disposal of all of the sponges;

providing a holder for holding a selected number of sponges so that each sponge is entirely visible;

separating and retaining said used sponges in said holder for visually verifying count and fluid content;

collecting any fluid lost from said sponges during their separation and retention in said holder and said collection bag;

providing containers which are each smaller than said collection bag and are sized to hold only said selected number of sponges from said holder; and

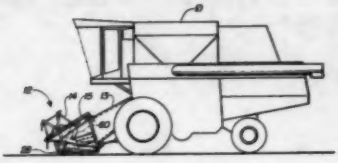
placing said sponges from said holder into one of said containers when said holder has been filled.

4,372,103

COMBINE DRIVE BELT SHIELDING

Irwin D. McIlwain, Lancaster, and James W. McDuffie, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 24, 1980, Ser. No. 209,781
Int. Cl.³ A01D 14/02
U.S. Cl. 56—14.4 10 Claims



1. A crop harvesting header forwardly attached to a mobile crop harvesting machine, in combination, comprising:

a frame including opposing, substantially vertically inclined first and second sidewalls aligned substantially parallel to the forward direction of travel of said crop harvesting machine;

a cutterbar mounted forwardly on said frame transverse to said direction of travel between said sidewalls to sever standing crop material, said cutterbar having two reciprocable sickle assemblies, each said sickle assembly being positioned adjacent one of said sidewalls and extending substantially halfway across said header toward the other said sickle assembly, said sickle assemblies being reciprocably operable in a timed counter-stroking relationship;

drive means mounted on each said sidewall for respectively reciprocating the adjacent said sickle assembly, each said drive means including a drive sprocket, a driven sprocket mounted for movement relative to said drive sprocket, a drive belt drivingly entrained between said drive sprocket and said driven sprocket and a tensioning means engaged with said drive belt to maintain tension therein during the movement of said driven sprocket relative to said drive sprocket, each said drive belt having a plurality of teeth on one side thereof with an interstitial space between adjacent teeth, said teeth drivingly cooperating with corresponding indentations in said drive sprockets and said driven sprockets to provide a timed relationship between each corresponding said drive sprocket and said driven sprocket such that said timed counter-stroking relationship between said sickle assemblies can be positively maintained, each said drive belt being entrained about the corresponding said drive sprocket and said driven sprocket such that at least one portion of each said drive belt is positioned with said teeth projecting upwardly, whereby said interstitial spaces are subject to being filled with extraneous dirt and debris; and

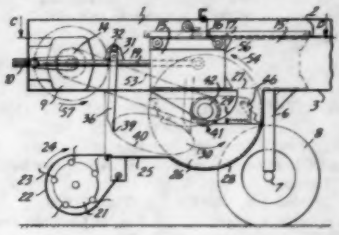
shielding means mounted on each said sidewall adjacent to and above the respective said at least one portion of each said drive belt for preventing extraneous dirt and debris from falling onto the respective said at least one portion of each said drive belt and filling up said interstitial spaces, such that the timed relationship between each said sickle assemblies will not be disrupted due to said drive belt teeth not being able to engage said sprocket indentations, each said shielding means including sliding means for compensating for changes in length between the corresponding said drive sprocket and said driven sprocket due to the movement of the driven sprocket relative to the respective drive sprocket.

4,372,104

PICK-UP BALER FOR AGRICULTURAL MATERIAL

Jürgen Simonis, Wolfenbüttel, and Helmut Czok, Schladen, both of Fed. Rep. of Germany, assignors to Gebrüder Welger GmbH & Co. Kommanditgesellschaft, Wolfenbüttel, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,313
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022631
Int. Cl.³ A01D 39/00
U.S. Cl. 56—341 10 Claims



1. Agricultural pick-up baler comprising wall means forming a compressing channel having a front end and a rear end with an inlet opening located in the bottom of said compressing channel intermediate the ends thereof, a pressing ram located within said compressing channel, means for reciprocating said pressing ram in the front end-rear end direction, said reciprocating means including at least one connecting rod extending in the front end-rear end direction and attached to said pressing ram for imparting reciprocating movement to said pressing ram, a pick-up device located below said compressing channel for picking up harvested agricultural material, a supply passage located below said compressing channel and extending between said pick-up device and said inlet opening into said compressing channel for receiving agricultural material from said pick-up device and for delivering the agricultural material into said compressing channel, a conveying device movable through said supply passage for moving the agricultural material from said pick-up device into said supply passage toward the inlet opening in said compressing channel, a packing device movable along the path through said supply passage downstream from said conveying device for forcing the agricultural material from said supply passage through the inlet opening into said compressing channel wherein the improvement comprises that said conveying device includes a plurality of prongs attached to said connecting rod and extending downwardly from said compressing channel into said supply passage with said connecting rod imparting an elliptical path of travel within said supply channel to the ends of said prongs spaced from said connecting rod and located within said supply channel, and the path of travel of the ends of the prongs within said supply channel extends into the path of travel of said packing device within said supply passage.

4,372,105

REVERSE OSCILLATED LAY CABLE

Benjamin C. Ellis, Jr., Snellville, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 63,009, Aug. 2, 1979, Pat. No. 4,266,399.
This application Mar. 2, 1981, Ser. No. 239,716
Int. Cl.³ H01B 13/04
U.S. Cl. 57—204 2 Claims

1. A cable, which comprises at least two concentrically disposed layers, each of said layers including a plurality of conductor units with each unit having a lay and comprising a plurality of concentrically disposed layers of twisted, insulated conductor pairs, each of said twisted conductor pairs having a unidirectional lay about a longitudinal axis of the unit which

varies among the units, the direction of lay of said units in each layer being periodically reversed to perturbate the unidirectional lay of said conductor pairs with the circular orientation of each unit relative to the other units in said each layer being substantially constant.

4,372,106

DRIVE SYSTEM FOR YARN FALSE TWISTING APPARATUS

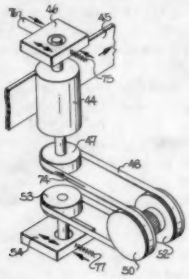
Detlev Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 272,940

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Dec. 23, 1980, 3048615

Int. Cl.³ D02G 1/08

U.S. Cl. 57—334 **22 Claims**



1. A yarn false twisting apparatus comprising

a frame,

a pair of twist imparting members, each having a generally flat yarn engaging friction surface,

means mounting said members to said frame for rotational movement wherein portions of the respective yarn engaging friction surfaces are disposed in opposing relationship and define a twisting zone therebetween,

drive means for operatively rotating each of said members, and such that a yarn may be advanced along a path of travel through said twisting zone while having twist imparted thereto, said drive means including

(a) a drive whorl rotatably mounted in a whorl support member,

(b) means mounting said whorl support member to said frame so that said drive whorl is rotatable about an axis generally parallel to the yarn path of travel through said twisting zone, and such that said drive whorl is adapted to be tangentially engaged by a main drive belt of said apparatus,

(c) a drive pulley rotatably mounted in said whorl support member and operatively connected to said drive whorl for concurrent rotation therewith,

(d) a belt pulley operatively connected to respective ones of said twist imparting members,

(e) an idler pulley,

(f) means rotatably mounting said idler pulley to said frame for rotation about an axis generally parallel to that of said drive pulley,

(g) drive belt means operatively interconnecting said drive pulley, said two belt pulleys, and said idler pulley for effecting concurrent rotation thereof with rotation of said drive whorl,

(h) at least one of said means mounting said whorl support housing, and said means mounting said idler pulley, being adjustable for movement with respect to said frame in a direction perpendicular to the yarn path of travel to thereby assure maintenance of an adequate tension on said drive belt means.

4,372,107

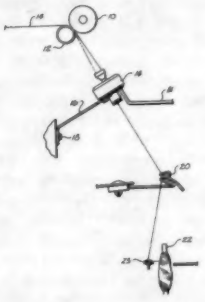
FALSE TWIST DEVICE

Douglas G. Hart, Greenville, S.C., assignor to High-Speed Spinning, Inc., Greenville, S.C.

Filed Dec. 17, 1980, Ser. No. 217,570

Int. Cl.³ D01H 7/92; D02G 1/04

U.S. Cl. 57—346 **8 Claims**



1. An apparatus for inserting a false twist in a strand of fibers as said strand is fed from between a pair of feed rolls to a takeup device, said apparatus comprising:

a casing,

a rotor rotatably carried in said casing;

a plurality of circumferentially spaced air entrapping members provided on said rotor;

a strand conveying tube extending axially through said casing and said rotor and being fixed to said rotor for rotation therewith;

a portion of said strand conveying tube being radially disposed from the rotational axis of said rotor;

said strand extending from between said pair of feed rolls through said strand conveying tube to said takeup device;

an upper portion of said strand conveying tube being in axial alignment with said rotor then has an intermediate portion that assumes an arcuate semi-circular configuration which is radially displaced from said axis and vertically positioned above said rotor and then has a lower portion extending through said rotor that is in axial alignment with said rotor; and

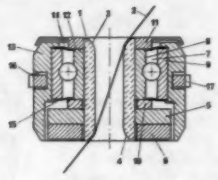
means for directing pressurized air into said air entrapping members provided on said rotor causing said rotor to be rotated whereby a false twist is imparted to said strand of fibers as said strand of fibers travels from said rolls to said takeup device.

4,372,108

ROTARY YARN GUIDE FOR TEXTILE MACHINES

Walter Uebelhart, Bienne; Beat Gilomen, Studen, and Claude Parel, Bettlach, all of Switzerland, assignors to A. Michael S.A., Switzerland

Filed Sep. 5, 1980, Ser. No. 184,314
Claims priority, application Switzerland, Sep. 7, 1979, 8084/79
Int. Cl.³ D01H 7/18, 13/04
U.S. Cl. 57—358 15 Claims



1. A rotary yarn guide device for cooperating with a spindle in a textile machine, comprising:

an externally cylindrical, hollow guide member having inlet and outlet ends for guiding the yarn;

a ball bearing surrounding the guide member and having inner and outer races, said inner race being rigid with said guide member;

a permanent magnet for cooperating with a spindle in order to rotate said guide member;

a magnet-supporting member for securing said permanent magnet with said guide member; and

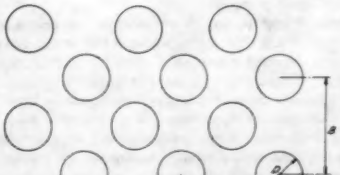
an outer casing fixed to the outer race of said ball bearing.

4,372,109

ROLLER FOR FRICTION SPINNING APPARATUS

William M. Farnhill, 335 Colne Rd., Burnley, Lancashire, and Alan Parker, 7 Darvel Close, Breightmet, Bolton, Lancashire, both of England

Filed Apr. 10, 1981, Ser. No. 252,968
Claims priority, application United Kingdom, Apr. 19, 1980, 8012959
Int. Cl.³ D01H 7/882
U.S. Cl. 57—401 8 Claims



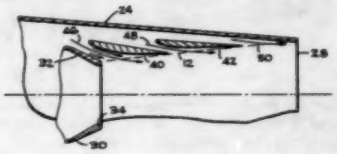
1. A roller for a friction spinning apparatus comprising a hollow perforated base member having on its outer surface a coating, characterized in that the thickness of the base member is at most 0.125 inches (3.2 mm), the percentage of hole area to total surface area of the base member, measuring the hole area as the summation of those at the smallest cross-section of each hole, is at least 25% and the diameter of each of the holes is at most 0.03 inches (0.75 mm).

4,372,110

NOISE SUPPRESSOR FOR TURBO FAN JET ENGINES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Dah Y. Cheng, Palo Alto, Calif.

Filed Feb. 13, 1976, Ser. No. 657,903
Int. Cl.³ F02K 1/44, 1/46
U.S. Cl. 60—262 3 Claims



1. A noise suppressor for a fan jet engine of the type that includes an elongate hollow housing having an upstream inlet and a downstream outlet, an engine pod with a longitudinal axis, the pod supported within the housing and having a converging jet nozzle symmetrical to the axis and extending downstream of the housing outlet, the pod having a cross-sectional shape smaller than the housing to define an annular by-pass air path in said housing, and a fan within the housing adjacent the inlet for supplying air to the engine pod and the by-pass path, said noise suppressor comprising a nacelle having an upstream extremity affixed to said housing outlet and a downstream circular shaped extremity which is symmetrical to said axis and disposed downstream of said converging nozzle, said nacelle having an air impervious wall that converges from said upstream extremity to said downstream extremity and confines by-pass air from said engine housing, at least a first ring airfoil rigidly mounted within said nacelle, said ring airfoil being symmetrical to said axis and having an upstream extremity upstream of the downstream extremity of said nozzle, said ring airfoil having a downstream extremity upstream of downstream extremity of said nacelle, the downstream extremities of said nozzle, ring airfoil and nacelle being positioned on a jet nozzle flow zero radial velocity locus which has the shape of a frusto conical surface whereby the by-pass air is injected into the jet nozzle flow and the local shear stress between the streams is reduced, and further including a second ring airfoil rigidly mounted within said nacelle, said second ring airfoil being symmetrical to said longitudinal axis and having an upstream extremity positioned between said nacelle and the downstream extremity of said first ring airfoil, the downstream extremity of said second ring airfoil being located on said locus.

4,372,111

METHOD FOR CYCLIC REJUVENATION OF AN EXHAUST GAS FILTER AND APPARATUS

Kashmir S. Virk, Hopewell Junction, and Martin Alperstein, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,815
Int. Cl.³ F01N 3/18, 3/36
U.S. Cl. 60—274 8 Claims

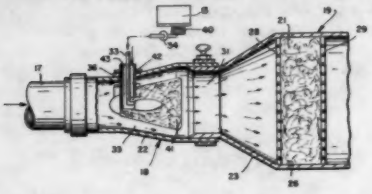
1. Method for treating an exhaust gas stream which carries an amount of particulate combustible matter, which method includes the steps of;

separating a minor flow of exhaust gas from the exhaust gas stream,

introducing the minor exhaust gas flow into contact with a catalytic material, and concurrently introducing a combustible medium with the minor exhaust gas flow into contact with said catalytic material to initiate combustion thereof,

intermixing said heated minor flow of exhaust gas with the

exhaust gas stream, to provide the mixed stream with a temperature exceeding the ignition temperature of the combustible particulate matter, and



passing the mixed, heated gas stream into a main filter element in which the residual particulate matter is retained whereby to incinerate said particulate matter.

4,372,112

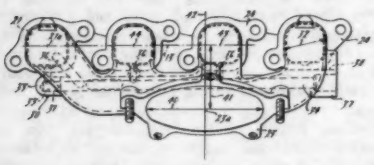
THIN-WALLED EXHAUST GAS MANIFOLD CASTING

Allen D. Ackerman, Troy; Conrad G. Perkey, Dearborn Heights; Robert A. Martin, Northville, and William M. Justusson, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 1, 1980, Ser. No. 164,868

Int. Cl.³ F01N *7/10, 3/34*

U.S. Cl. 60—323 **1 Claim**



1. An exhaust gas manifold casting for an internal combustion engine, comprising:

(a) inlet duct walls defining a plurality of inlet ducts each having an inlet opening, said inlet openings being arranged in a common plane and having the centers of said inlet openings lying along a straight line;

(b) outlet duct walls defining a singular shallow outlet duct intersecting and communicating with said inlet ducts, said outlet duct describing an ellipse in cross section and having an outlet opening with a center located from said straight line a distance no greater than the major dimension of said elliptical cross section, said outlet duct having an axis passing through the center of said elliptical cross section and projecting between axes extending through the centers of the inlet openings of the innermost inlet ducts, said outlet and inlet duct walls consisting essentially of nodular cast iron and having a generally uniform wall thickness in the range of 0.12–0.15 inches; and

(c) an integrally cast rib extending across at least a plurality of said inlet ducts to reduce flexing of said manifold in service.

4,372,113

PIPELINE ENERGY RECAPTURE DEVICE

James L. Ramer, Rte. 1, Box 382, Whitestown, Ind. 46075

Filed Jan. 15, 1981, Ser. No. 225,170

Int. Cl.³ F01D *1/00*

U.S. Cl. 60—325 **11 Claims**

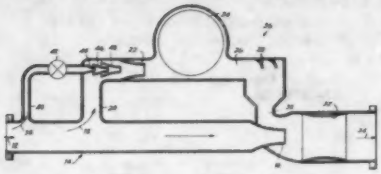
1. Apparatus for recapturing flow power of a fluid in a pipeline comprising:

(a) a constriction in said pipeline;

(b) a first bypass path for directing a first portion of said fluid past said constriction;

(c) a second bypass path for directing a second portion of said fluid past said constriction;

(d) means, disposed in said second bypass path, for accelerating a portion of the fluid in said first bypass path;



(e) means for producing a mechanical output from the fluid in said first and second bypass paths,

(f) means for returning substantially all said fluid from said first and second bypass paths to said pipeline at a point downstream of said constriction.

4,372,114

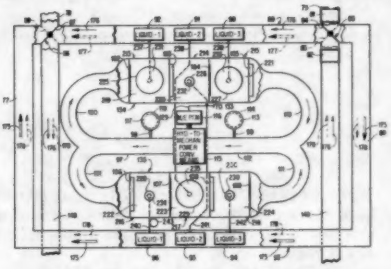
GENERATING SYSTEM UTILIZING MULTIPLE-STAGE SMALL TEMPERATURE DIFFERENTIAL HEAT-POWERED PUMPS

Francis L. Burnham, Orangeburg, S.C., assignor to Orangeburg Technologies, Inc., Orangeburg, S.C.

Filed Mar. 10, 1981, Ser. No. 242,243

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—325 **27 Claims**



1. A generating system for converting flow of a first liquid to electrical power comprising:

a. A plurality of multiple-stage small temperature differential heat-powered pumps;

b. a second liquid heating means operable to heat a second liquid to a hot temperature, where it becomes a hot liquid which is divertable into said plurality of multiple-stage small temperature differential heat-powered pumps;

c. a third liquid cooling means operable to cool a third liquid to a cold temperature where it becomes a cold liquid which is divertable into said plurality of multiple-stage small temperature differential heat-powered pumps;

d. a hydraulic-to-mechanical power conversion means operative to convert the flow of said first liquid to mechanical power with the input to said hydraulic-to-mechanical power conversion means connected to the output of said plurality of multiple-stage small temperature differential heat-powered pumps and the output of said hydraulic-to-mechanical power conversion means connected to the input of said plurality of multiple-stage small temperature differential heat-powered pumps; and

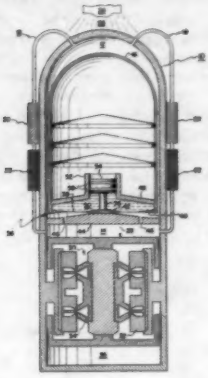
e. a mechanical-to-electrical power conversion means connected to said hydraulic-to-mechanical power conversion means and operative to produce electrical power.

4,372,115

OIL BACKED STIRLING ENGINE DISPLACER DIAPHRAGM

Jeffrey S. Rauch, Albany, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,974
Int. Cl.³ F02G 1/04
U.S. Cl. 60—520 15 Claims



1. In a free piston Stirling engine having a vessel defining therein a working space in which oscillates a displacer, and a flexible diaphragm connected between said vessel and said displacer, wherein the improvement comprises:

a liquid cavity having two sides and bounded on one of said sides by said diaphragm, and bounded on the other of said sides by a bounding member; and

means for accommodating the volumetric changes caused by the deflection of said diaphragm into and out of said cavity when said displacer oscillates;

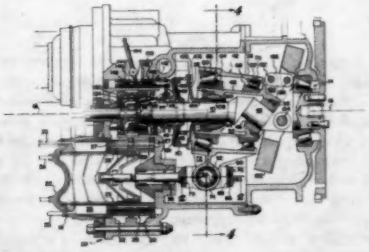
whereby pressure in said working space is transmitted through said diaphragm and the liquid in said cavity to said bounding member so that pressure stresses in said diaphragm are reduced.

4,372,116

STIRLING ENGINE CONTROL MECHANISM AND METHOD

John J. Dineen, Durham, N.H., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,457
Int. Cl.³ F02G 1/06
U.S. Cl. 60—525 20 Claims



1. A mechanism for conversion between reciprocating motion of a reciprocating member and rotating motion of a rotating shaft, comprising:

a rotatable shaft having a straight portion disposed on an axis of rotation, and an offset portion whose axis extends at an angle to said axis of rotation;

a hub mounted on said shaft for rotation relative thereto and having one axial end portion axially slidably mounted on said offset portion, and the other axial end portion axially slidably mounted on said straight portion;

at least one arm mounted on said hub and extending radially therefrom, whereby said arm rocks in a reciprocating arcuate motion when said shaft rotates and said hub nutates relative to said rotating shaft; and

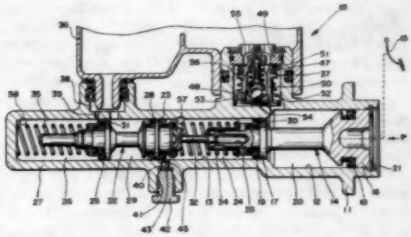
means for controllably moving said hub axially relative to said shaft, thereby changing the angle of inclination of said hub relative to said shaft axis of rotation to control the stroke of said arm.

4,372,117

BRAKE MASTER CYLINDER FOR MOTOR VEHICLES

Hideyuki Kobayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1980, Ser. No. 192,202
Claims priority, application Japan, Oct. 8, 1979, 54-129607
Int. Cl.³ B60T 11/20
U.S. Cl. 60—562 7 Claims



1. A brake master cylinder for motor vehicles comprising in combination:

a cylinder body provided with a large diameter bore and a small diameter bore therein,

a stepped primary piston provided with a large diameter portion slidably fitted in said large diameter bore and a small diameter portion slidably fitted in said small diameter bore,

a secondary piston slidably fitted in said small diameter bore and associated with said primary piston,

a first fluid chamber defined between said large and small diameter portions of said primary piston,

a primary pressure chamber defined between said small diameter portion of said primary piston and one end of said secondary piston,

a secondary pressure chamber defined between said cylinder body and the other end of said secondary piston,

a second fluid chamber defined between said one end of secondary piston and said other end thereof and being in continuous fluid communication with a reservoir, and

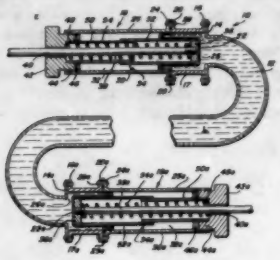
compensation port means disposed in operative relationship with said secondary piston and in continuous fluid communication with said primary pressure chamber for providing fluid-flow communication between said primary pressure chamber and said second fluid chamber during brake release and for preventing fluid-flow communication between said primary pressure chamber and said second fluid chamber upon brake application.

4,372,118

LIQUID CABLE

Herman J. Andresen, 726 Carriage Hill Dr., Glenview, Ill. 60025

Continuation of Ser. No. 735,799, Oct. 26, 1976, abandoned.
This application Jun. 19, 1978, Ser. No. 916,869
Int. Cl.³ F15B 7/08
U.S. Cl. 60—583 1 Claim



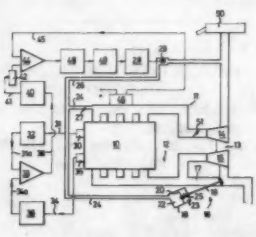
1. A liquid cable device for receiving and transmitting mechanical force and displacement, comprising first and second terminal units adapted to receive and transmit the mechanical force and displacement, each terminal unit including piston means mounted within a chamber formed in said unit for movement therein between predetermined stroke limits, and biasing means for biasing said piston means towards one end of said chamber for all positions of the piston means within the chamber; tubing means having a predetermined interior volume interconnecting the corresponding one ends of the terminal unit chambers; and a substantially non-compressible liquid disposed within said tubing means interior, the volume of said liquid being substantially greater than the tubing means interior volume and effecting a predetermined displacement of each of said piston means within the respective chamber whereby each piston means assumes a predetermined rest position intermediate the stroke limits thereof and is disposed a substantial distance from each stroke limit, the internal forces on the piston means being in balanced relation only when each piston means is in said rest position, the piston means of said terminal units coacting with one another to maintain the liquid within the tubing means under a continuous substantial positive pressure with respect to the environmental pressure of said device for all positions of adjustment of the piston means within said chambers, the application of an external mechanical force to effect displacement of a selected terminal unit piston means while in said rest position in either a direction towards or away from the chamber one end simultaneously altering the energization of the biasing means associated therewith and affecting an imbalance of internal forces within said selected unit chamber, the force imbalance within said selected unit chamber effecting a predicted correlative displacement of the non-selected terminal unit piston means in all possible stroke positions and simultaneously altering the energization of the biasing means associated therewith in opposite relation to the biasing means for the selected terminal unit piston means, upon removal of the external force the imbalance of internal forces within both of the terminal unit chambers effecting automatic return of both piston means to their respective predetermined rest positions, wherein the tubing means includes a liquid passage restrictor and a liquid pressure accumulator, said restrictor preventing substantially instantaneous transmission of the entire volume of liquid between the terminal units displaced by the continued application of an external input displacement force applied to the selected terminal unit piston means and moving the latter from the rest position towards the chamber one end of the selected terminal unit; said accumulator including a piston element disposed within an auxiliary chamber communicating with the tubing means at a location upstream from said restrictor and downstream of said selected terminal unit, and biasing means for urging said piston element into a predetermined first position within the auxiliary chamber, the volume of liquid displaced by the input displacement force and not instantaneously transmitted to the non-selected terminal unit accumulating within the auxiliary chamber and effecting displacement of the accumulator piston element from said first position and substantially simultaneous energizing of the accumulator biasing means such that said volume of liquid within said auxiliary chamber will be continually urged through said restrictor and to the non-selected terminal unit until said piston element returns to said first position and the external displacement input force continues to be applied to the selected terminal unit piston means and wherein the tubing means includes a tributary tubing member having one end thereof communicating with said tubing means upstream of said restrictor and the opposite end communicating with a third terminal unit, an input displacement force continually applied at said selected terminal unit positioned upstream of said accumulator generating a liquid displacement transmitted to said third terminal unit as a first output displacement, and subsequently to said non-selected terminal unit as a delayed output displacement.

4,372,119

METHOD OF AVOIDING ABNORMAL COMBINATION IN AN INTERNAL COMBINATION ENGINE AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

Per S. Gillbrand, Enhörna; Simon E. Axelson, Huddinge, and Sten R. Jiewertz, Järna, all of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed May 21, 1980, Ser. No. 151,897
Claims priority, application Sweden, Oct. 29, 1979, 7908944
Int. Cl.³ F02B 37/00
U.S. Cl. 60—600 6 Claims



1. A method of avoiding abnormal combustion, so-called knocking, in a supercharged internal combustion engine, comprising the steps of monitoring a parameter representative of the combustion conditions prevailing in the engine, generating a first signal representing said parameter, sensing the engine speed, generating a second signal proportional to the engine speed and representing optimum combustion in the engine, comparing said first signal with said second signal to obtain a deviation signal, whereby, when abnormal combustion occurs in the engine, said deviation signal initiates an adjustment of the engine operating conditions for eliminating abnormal combustion, wherein the engine operating conditions are adjusted by reducing the engine induction pressure in response to the magnitude of said deviation signal to a level providing normal combustion.

4,372,120

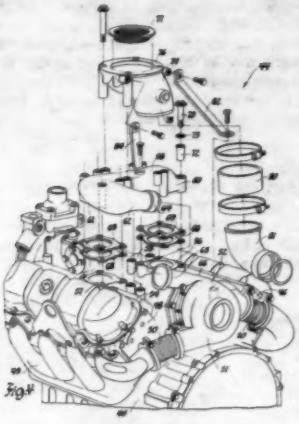
V-TYPE ENGINE INTAKE WITH VIBRATION ISOLATED MANIFOLD CONNECTOR

Harry S. Ford, Jr., Birmingham, and Nahan Hamparian, Brighton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 88,298, Oct. 26, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,890

Int. Cl.³ F02B *37/00, 75/22*

U.S. Cl. 60—605 **5 Claims**



1. In combination in a V-type engine having a pair of angularly disposed cylinder banks extending from a common crankcase and defining an intermediate valley,

a pair of air intake manifolds secured one to each of said cylinder banks and spaced laterally from one another on opposite sides of the valley to deliver air charges to the engine cylinders,

a manifold connector mounted upon and connecting with both said intake manifolds to carry charging air from a common supply to the manifolds, and

isolation mounting means between said connector and said manifolds to limit the transmission of noise creating vibrations between the manifolds and cylinder banks and to the manifold connector, said isolation mounting means including resilient gaskets operatively disposed between each of said manifolds and said connector to seal the joints therebetween and isolated controlled compression securing means operatively connected between said connector and each associated manifold member and resiliently isolated from at least one of them, while retaining said connector on said manifolds with predetermined partial compression of said gaskets so as to provide complete resilient isolation of the connector from both the manifolds on which it is mounted.

4,372,121

POWER-PLANT

Sergei S. Sokolov, ulitsa Nevzorovoi, 6, kv. 67; Vadim R. Komovsky, ulitsa Novoligovskaya, 13, kv. 53; Leonid I. Vlasov, Drezdenskaya ulitsa, 18, kv. 18; Boris M. Boretsky, ulitsa Furmanova, 14, kv. 46, and Grigory V. Shiryaev, ulitsa Matrosa Zheleznyaka, 53, kv. 60, all of Leningrad, U.S.S.R.

Filed Mar. 16, 1981, Ser. No. 244,076

Int. Cl.³ F02B *37/00*; F02D *23/00*

U.S. Cl. 60—606 **3 Claims**

1. A power-plant comprising:

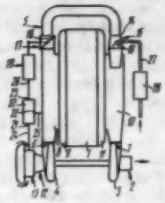
an internal-combustion engine;

a turbo-charger providing the supercharging of said internal-combustion engine and having at least one turbine and one compressor, an inlet of said internal-combustion engine communicating with an outlet of said compressor of said turbo-charger, an inlet of said turbine communicating with an outlet of said internal-combustion engine;

a by-pass duct communicating said outlet of said compressor with said inlet of said turbine;

an auxiliary combustion chamber arranged in said by-pass duct; an air flow rate adjusting device for air by-passed from said compressor to said turbine, having a throttling member;

a drive linked with said throttling member and providing



variation of position of said throttling member in said by-pass duct;

an air flow sensor installed at said inlet of said compressor; and

a comparison unit having a first input, a second input and an output, said first input communicating with said by-pass duct between said outlet of said compressor and said air flow rate adjusting device, said second input communicating with said air flow sensor, and

said output of said compression unit communicating with said drive for changing position of said throttling member.

4,372,122

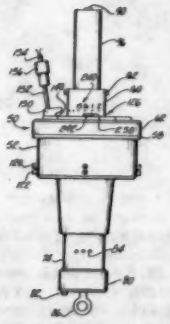
PROPELLANT OPERATOR

Heinrich F. von Wimmersperg, 15721 Rosemont Rd., Detroit, Mich. 48223, assignor to Heinrich von Wimmersperg, Detroit, Mich.

Filed Jun. 17, 1980, Ser. No. 160,392

Int. Cl.³ F01B *29/08*

U.S. Cl. 60—634 **23 Claims**



1. A propellant activated operator comprising a receiver body, a plurality of separate cartridge chambers in said body each constructed and arranged to receive a cartridge therein, a closure member carried by said body and constructed and arranged to close off the ends of said cartridge chambers through which cartridges can be inserted, a receiving chamber carried by said body, a separate passage associated with each of said cartridge chambers and constructed and arranged to

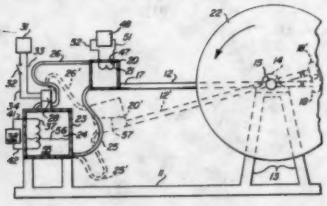
connect each cartridge chamber with said receiving chamber, a valve associated with each cartridge chamber and its passage and constructed and arranged to be normally closed so that its cartridge chamber does not communicate with said receiving chamber and to open when a cartridge in its chamber is fired so that gases produced by the firing of the cartridge will pass from such cartridge chamber through its associated passage and into said receiving chamber, and firing means carried by said body and constructed and arranged to rapidly fire in sequence, cartridges received in said cartridge chambers of said body, said firing means having a distributor with a contact associated with each cartridge chamber and constructed and arranged to be in contact with an electrically energized primer of a cartridge received in said cartridge chamber, a plurality of second electric contacts each connected by an electric conductor with only one of said first contacts, a rotor having a rotor contact constructed and arranged to sequentially engage said second contacts to sequentially direct an electric current to said first contacts to fire cartridges received in said cartridge chambers in a predetermined firing order, a pawl carried by said rotor, a plurality of stops disposed in circumferentially spaced apart relationship about the axis of rotation of said rotor and each constructed and arranged to engage with said pawl to releasably restrain movement of said rotor when said rotor contact engages one of said second contacts, and an actuator associated with each said valve and constructed and arranged to be moved to a first position by opening of said valve to engage said pawl and release it from said stop to permit said rotor to be moved so that it is disengaged from all of said second contacts and to be moved to a second position by closing of said valve to disengage its actuator from said pawl to permit said rotor to be moved until said pawl bears on another stop to thereby engage said rotor contact with another of said second contacts.

4,372,123

THERMAL-GRAVITY ENGINE

Kenneth L. Austin, 909 E. Cypress Ave., Lompoc, Calif. 93436

Filed Sep. 2, 1981, Ser. No. 298,599
Int. Cl.³ F03G 7/00; F03B 17/06
U.S. Cl. 60—639 **10 Claims**



1. A thermal-gravity engine comprising:

at least one lever arranged to reciprocate between up and down positions about a pivot for actuating an output shaft;

fluid loading and unloading means including a weight chamber on one end of said lever that is normally held in an up position by a counterweight on said lever opposite said weight chamber and a storage chamber disposed below said weight chamber, a first flow line coupled in flow communication with lower portions of said chambers, and a second flow line coupled in flow communication with the upper portions of said chambers to form a closed, fluid-flow system which contains a working fluid;

thermal input means associated with at least one of said chambers to change the temperature in said one chamber to produce an internal pressure differential between the upper portions of said chambers; and

blocking means for said upper flow line to normally block fluid flow through said upper flow line and arranged to allow fluid flow when said lever is moved to the down position,

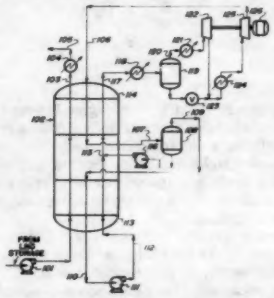
whereby, with the weight chamber up and upon the production of said internal pressure differential, the working fluid is pumped from said storage chamber into said weight chamber via said first flow line until the weight thereof is sufficient in relation to said counterweight to cause said one end of the lever to move to the down position under the force of gravity in a downstroke to apply a torque to said output shaft, the second flow line then being opened to provide an equalizing of the pressures in the upper portion of said chambers to allow the drainage of the working fluid from said weight chamber via said first flow line back into the storage chamber so that the weight of the weight chamber is reduced sufficiently to cause the lever to move up in an upstroke due to the force of gravity acting on said counterweight.

4,372,124

RECOVERY OF POWER FROM THE VAPORIZATION OF NATURAL GAS

Charles L. Newton, Bethlehem, and Dennis L. Fuini, Schnecksville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 6, 1981, Ser. No. 241,185
Int. Cl.³ F01K 17/00
U.S. Cl. 60—648 **4 Claims**



1. A method for recovering power from the vaporization of liquefied natural gas which method comprises at least partially liquefying a multicomponent mixture with said liquefied natural gas, pumping said at least partially liquefied multicomponent mixture to an elevated pressure, heating said pressurized multicomponent mixture to form a vapor, expanding said vapor through expansion means, and recovering power from said expansion means, characterized in that said pressurized multicomponent mixture is heated to provide a two phase mixture, said two phase mixture is separated to provide a vapor and a liquid, said vapor is expanded in a first expander, the expanded vapor and a two phase mixture formed by expanding the liquid from said phase separator through a valve are heated and the resulting vapor passed through a second expander, and power is recovered from first and second expanders.

4,372,125

TURBINE BYPASS DESUPERHEATER CONTROL SYSTEM

Royston J. Dickenson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

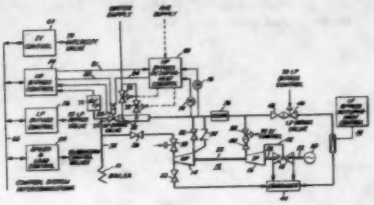
Filed Dec. 22, 1980, Ser. No. 218,765
Int. Cl.³ F01K 13/02
U.S. Cl. 60—660 **11 Claims**

1. In combination with a steam turbine having a bypass system for diverting excess steam supplied by a steam generator from the turbine and including means for desuperheating

the bypassed steam and at least one steam flow control valve, a steam desuperheater control system for controlling the temperature of desuperheated steam, comprising:

temperature determining means providing a representation of the temperature of the desuperheated steam;

first control means operatively connected to said desuperheating means and responsive to said temperature representation to provide corrective action to said desuperheating means tending to maintain the temperature of the desuperheated steam at a preselected temperature reference value;



steam flow determining means providing a representation of steam flow rate in said bypass subsystem; and

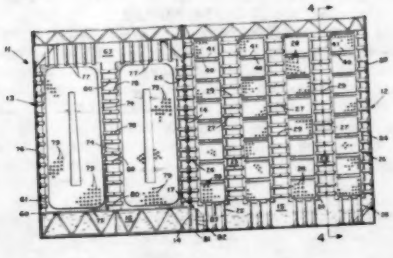
second control means responsive to said steam flow representation and interactive with said first control means to alter said corrective action as a function of steam flow rate in said bypass subsystem.

4,372,126

CLOSED CYCLE SYSTEM FOR GENERATING USABLE ENERGY FROM WASTE HEAT SOURCES

Joseph F. Sebald, deceased, late of Bloomfield, N.J. (by Dorothy Davis Sebald, executrix), assignor to Heat Power Products Corporation, Bloomfield, N.J.

Filed May 1, 1981, Ser. No. 259,531
Int. Cl.³ F01K 11/00
U.S. Cl. 60—669 5 Claims



1. A closed cycle system for recovering usable energy from the difference in temperature between a heat source and a heat sink wherein the available temperature difference is at least 40° F., includes,

a. an evaporator-condenser assembly having a non-contacting evaporating section, a non-contacting condensing section, and a common partition mounted in and shared between the evaporating section and the condensing section so as to define respectively therein an evaporating chamber having a storage well for the operating fluid for the closed cycle system and a condensing chamber having a condensate well for condensed operating fluid, and said common partition having transport opening means at the lowermost end thereof,

b. a short upwardly extending baffle means connected in the evaporating section a predetermined spaced distance from the common partition to form therewith a U-shaped seal and transport passage for passing predetermined quantities of the condensed operating fluid from the condensate well to the storage well as a function of the difference in the level of operating fluid in the respective condensate well and storage well,

c. said evaporating section including, means for evaporating operating fluid including, pumping means connected to deliver heated fluid from said heat source, and a return means for returning said heated fluid to said heat source,

d. energy converting means connected to said evaporator-condenser assembly having an inlet communicating with said evaporating section to receive the vaporized operating fluid therefrom and operable to convert the heat energy in said vaporized operating fluid to usable energy, and an exhaust outlet for spent vaporized operating fluid,

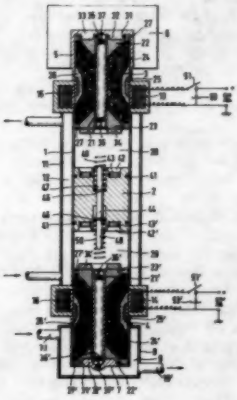
e. said condensing section communicating with the exhaust outlet of said energy converting means and including, means for condensing the exhausted vapor from said energy converting means including, pumping means connected to deliver cooling fluid from said heat sink, and a return means for returning the cooling fluid to said heat sink.

4,372,127

APPARATUS FOR HEAT TRANSFORMATION

Erich Pöhlmann, Kulmbach, and Hans-Peter Doetsch, Altdrossenfeld, both of Fed. Rep. of Germany, assignors to Christian Schneider, Kulmbach, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,719
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945973
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 24 Claims



1. Apparatus for heat transformation comprising a cylinder closed to the outside,

a working piston movably confined within a central part of said cylinder,

at least one impact piston movably confined within and adjacent one end of said cylinder and including regenerator means,

a heat transfer fluid acting as a working medium within said cylinder,

means for supplying heat to the cylinder from the outside adjacent the end containing the impact piston,

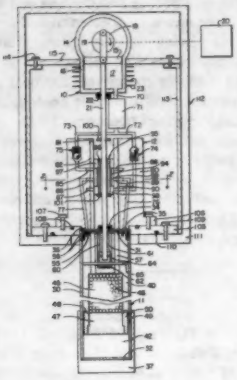
means to electromagnetically urge the impact piston towards the working piston,

means for withdrawing heat from the outside surface of the cylinder.

4,372,128
IN-LINE CRYOGENIC REFRIGERATION APPARATUS OPERATING ON THE STIRLING CYCLE

Domenico S. Sarcia, Carlisle, Mass., assignor to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 316,995
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 11 Claims



1. A cryogenic apparatus for delivering refrigeration to an external load, comprising in combination:

(a) compressor means having a rotary-driven reciprocating piston;

(b) expander means having displacer means capable of reciprocating motion to define within said expander means a warm fluid chamber and a cold fluid chamber, said chambers being of variable complementary volumes;

(c) thermal storage means providing fluid communication between said fluid chambers;

(d) driving means mechanically linking said piston and said displacer means to move them in phase along a common axis;

(e) fluid flow passage means connecting said compressor means and said expander means; and

(f) fluid flow control means associated with said fluid flow passage means and arranged so as to

(1) cut off fluid flow from said compressor means to said expander means throughout a major part of the compression stroke of said compressor;

(2) permit flow of high-pressure fluid from said compressor means to said warm fluid chamber during the completion of said compression stroke;

(3) cut off fluid flow from said expander means to said compressor means throughout a major part of the transference of fluid from said warm chamber to said cold chamber through said regenerator; and

(4) then permit flow of fluid from said expander means to said compressor means expanding said fluid and developing refrigeration within said cold fluid chamber.

4,372,129
FAIL-SAFE REFRIGERATION FOR CONTINUOUS PROCESS

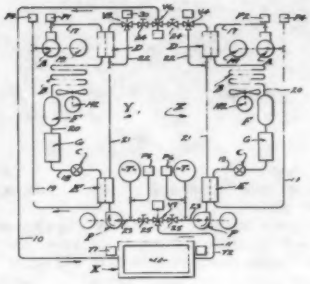
Benjamin R. Bennett, West Covina; Leroy D. McBee, Brea, and Richard F. Horak, Fullerton, all of Calif., assignors to Moore & Hanks Co., South El Monte, Calif.

Filed May 19, 1981, Ser. No. 265,183
Int. Cl.³ F25B 7/00; F25D 17/02
U.S. Cl. 62—175 8 Claims

1. Fail-safe refrigeration for continuous processes and including in combination;

dual refrigeration means comprised of primary and secondary mechanical heat absorption systems and each operable independently of the other to absorb heat from a mass required to remain continuously refrigerated, each system being comprised of a compressor means, a condenser means, an expansion means and a power means to operate the same, whereby heat absorption is effected through the expension of a compressed refrigerant fluid to chill said mass,

a reversible transfer valve means alternately applying the heat absorption effect of one of the heat absorption systems to said mass,

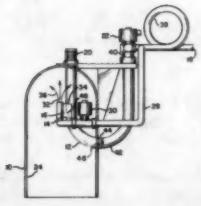


and failure responsive control means comprised of at least one condition responsive means in the dual refrigeration means and adapted to sense a malfunction thereof, and a double pole double throw relay that switches in response to the condition responsive means at one heat absorption system to alternately operate the power means of the primary and secondary heat absorption systems and to reverse the transfer valve means to reverse operation from one heat absorption system to the other.

4,372,130
CARBON DIOXIDE SNOW GENERATOR WITH PURGING MEANS

David J. Klee, Emmaus; Norris G. Lovette, Jr., Breinigsville; David R. Ruprecht, Laurys Station; John F. Boyle, Emmaus, and John C. Mullane, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

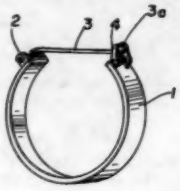
Filed Sep. 17, 1981, Ser. No. 303,279
Int. Cl.³ F25D 13/00
U.S. Cl. 62—330 9 Claims



1. In an apparatus for depositing carbon dioxide snow on a product comprising: a reversing diffuser chamber having side walls, a closed upper end, and an open bottom; means for separating a two-phase flow of gaseous and solid carbon dioxide into separable high velocity streams of gaseous and solid carbon dioxide; and means for directing said high velocity stream of solid carbon dioxide upwardly into said reversing diffuser chamber whereby said stream is reversed, diffused and reduced in velocity to form a dispersed, downwardly flowing,

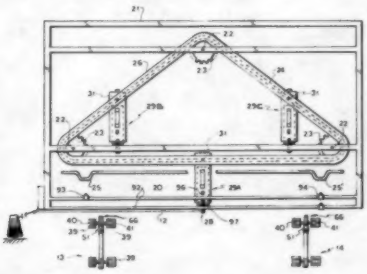
low velocity stream of carbon dioxide snow, the improvement comprising a purge means which can controllably direct a high speed blast of a purge stream of pressurized fluid, at the inside surface of the reversing diffuser chamber to remove any residual carbon dioxide snow on said surfaces.

4,372,131
EARRING WITH LATCH MEMBER
Robert Musillo, 5481 Wolf Dr., Pittsburgh, Pa. 15236
Filed Jul. 17, 1981, Ser. No. 284,482
Int. Cl.³ A44C *7/00*
U.S. Cl. 63—12 **7 Claims**



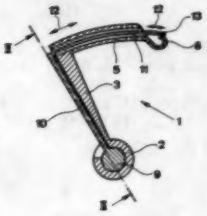
1. An earring for pierced ears, said earring comprising an arcuate ornamental portion of less than 360° having ends bridged by a post for piercing the ear, said post pivotally connected to one end of the arcuate portion, a latch member pivotally connected by pin means to the other end of the arcuate portion on the outer periphery thereof, spring means urging said latch member towards said one end of the arcuate portion and a hole formed in said latch member through which the free end of said post is adapted to extend so as to lock said post against pivotal movement and secure said earring on the ear of the wearer.

4,372,132
APPARATUS FOR FEEDING FILLING THREADS TO A WRAP KNITTING MACHINE
Rudolph G. Bassist, 1003 McGrann Blvd., Lancaster, Pa. 17601
Filed Dec. 8, 1980, Ser. No. 214,353
Int. Cl.³ D04B *27/10*
U.S. Cl. 66—84 A **11 Claims**



1. Apparatus for feeding filing threads to a warp knitting machine comprising:
first and second spaced apart conveyor means extending toward the knitting instrumentalities of the machine,
a plurality of thread clamping means carried by and movable with each of said conveyor means,
a plurality of filling thread supplies,
at least two guide means, each movable from the first conveyor means to the second conveyor means, for drawing filling threads from the thread supplies to positions adjacent to but spaced from the clamping means of both conveyor means, the two guide means being spaced apart in the direction of their movement,
each of the guide means including a carriage and a body carried by, and movable with respect to, the carriage, means mounted on the body for gripping the filing threads, and means for moving the body with respect to the carriage toward the conveyor means for inserting the filling threads into the clamping means of the conveyor means.

4,372,133
PUSHER NEEDLE
Jakob Müller, Stansstad, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland
Filed Nov. 12, 1980, Ser. No. 206,291
Claims priority, application Switzerland, Nov. 29, 1979, 10618/79
Int. Cl.³ D04B *35/04*
U.S. Cl. 66—120 **4 Claims**

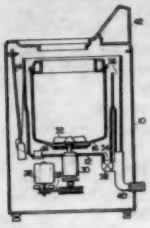


1. A pusher needle comprising:
a rotatable foot portion;
curved shaft portion is connected at right angles with a radially extending shaft portion and to said rotatable foot portion for accomplishing oscillating movements of said shaft portion;
said curved shaft portion having a head configured to form an open needle hook;
said curved shaft portion possessing a curved opening extending therethrough;
a curved pusher portion is connected with a radial pusher portion, said curved pusher portion is guided in said curved opening for carrying out a sliding movement between a forward position, in which the open needle hook is closed, and a retracted position where the open needle hook is open; and
said curved pusher portion being formed of spring steel and having a straight end covering said open needle hook in said forward position.

4,372,134
WASHING MACHINE
Katsuharu Matsuo, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 30, 1981, Ser. No. 229,850
Claims priority, application Japan, Feb. 1, 1980, 55-11698; Feb. 4, 1980, 55-12232; Feb. 5, 1980, 55-13247[U]; Feb. 6, 1980, 55-13632[U]
Int. Cl.³ D06F *33/02*
U.S. Cl. 68—12 R **6 Claims**

1. A washing machine comprising:
a tub for receiving a laundry, detergent and water;
a pulsator provided at the bottom of said tub;
a detector disposed inside said tub for detecting air bubbles in the water and for producing a detection signal;
drive means for supplying a drive signal to said pulsator; and
control means connected to said detector and drive means for storing a reference signal which is produced from said

detector when said pulsator is not operated and for controlling said drive means according to the difference be-



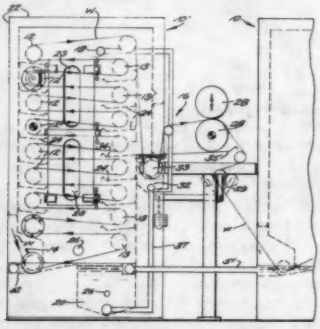
tween said reference signal and the detection signal during the operation of said pulsator.

4,372,135

HORIZONTAL WASHER APPARATUS

Klaus Heidan, Krefeld, Fed. Rep. of Germany, assignor to Greenville Steel Textile Machinery Corporation, Greenville, S.C.

Filed May 11, 1979, Ser. No. 38,411
Int. Cl.³ D06B 3/12
U.S. Cl. 68—22 R 12 Claims



1. Apparatus for the continuous wet treatment of moving textile webs, including a chamber through which the web passes in serpentine fashion along substantially horizontal, vertically spaced, travel paths supported by a plurality of rollers rotatable about horizontal axes and disposed in two vertical columns, the rollers in each column being horizontally spaced from the rollers in the other column and vertically offset with respect thereto; an entry for the web at a lower portion on one side of said chamber; an exit for the web at the opposite side of said chamber; means for introducing treating liquid at the top of said chamber to pass downwardly in said chamber to treat the web at various horizontal travel paths;

and a liquid seal at said web exit comprising means for introducing treating liquid into said chamber at an intermediate portion of said chamber, vertically between said means for introducing treating liquid at the top of said chamber, and said web entry, so that liquid overflowing from said liquid seal provides treating liquid to said chamber at and below said web exit; said liquid seal having a redirecting roller provided therein;

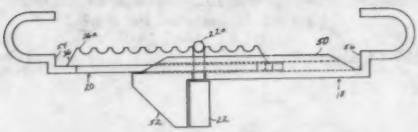
said means for introducing treating liquid at an intermediate portion further comprising a trough disposed adjacent the top of said liquid seal and directing overflow from said liquid seal into the web at a horizontal travel path thereof.

4,372,136

LOCK PROTECTING HASP

Thorwald J. Mickelson, Excelsior, Minn., assignor to Transportation Security Inc., Eden Prarie, Minn.

Filed Aug. 27, 1980, Ser. No. 181,949
Int. Cl.³ E05B 73/00; E05C 19/18
U.S. Cl. 70—14 12 Claims



1. Lock-protecting hasp for use with opposing bars of full swing rear truck trailer doors, said lock-protecting hasp comprising:

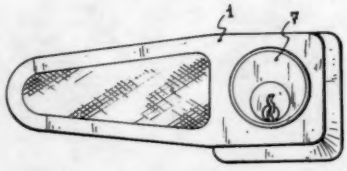
opposing aligned male and female mating J-shaped members, each of said mating members including opposing holes, said female member including opposing channels on an inside leg of said J member for accepting said male member and a protector block on an outside leg of said J member, adjacent said opposing holes, said male member including opposing longitudinal slots in a leg of said male member and a longitudinal ribbed locking bar on an inside of said leg between said longitudinal slots whereby a shackle of a lock connects through each of said aligned holes of said mated members and said shackle engages between two of said ribs when said members are adjusted together about bars of said trailer doors and said protector block is adjacent said lock, thereby preventing any area or space exposed between said shackle and said lock body of said legs of said outside mounting hasps.

4,372,137

LOCK

Francisco E. Garcia, Madrid, Spain, assignor to Patentes FAC, S.A., Madrid, Spain

Continuation-in-part of Ser. No. 930,511, Aug. 3, 1978, Pat. No. 4,226,099. This application Jul. 22, 1980, Ser. No. 171,118
The portion of the term of this patent subsequent to Oct. 7, 1999, has been disclaimed.
Int. Cl.³ E05B 67/08
U.S. Cl. 70—41 3 Claims



1. A lock comprising:

(a) a first element constituted by solid cast material and comprised of a flat elongated base with a first leg and a second leg extending perpendicularly from the ends of said base, the first of said legs defining a recess and a cavity therein, said recess being parallel to said flat elongated base;

(b) a second element mounted parallel to said flat elongated base of said first element and being rotatably mounted on said second leg such that the other end of said second element may be rotated into and out of the recess in said first leg of said first element, said second element having a

cavity therein, the cavity in said second element having a channel located in a wall thereof;

(c) a locking element movably disposed in the cavity of said first element and being movable into and out of engagement with the cavity of said second element, said locking element having a locking device disposed offset from the geometric center of said locking element, said locking device having a radial arm movable into and out of engagement with said channel in said cavity of said second element when said locking element is moved into engagement with said cavity of said second element.

4,372,138

PROTECTING DEVICE FOR PADLOCKS OR OTHER SIMILAR LOCKS

William E. De Forrest, 10432 Courson Dr., Stanton, Calif. 90680

Filed Oct. 1, 1980, Ser. No. 192,886

Int. Cl.³ E05B 67/38

U.S. Cl. 70—56 **2 Claims**

1. In a protection device of the type having first and second protector halves hingedly associated with each other, said first and said second halves joining together along a substantially planar junction, said halves when associated together along said planar junction substantially forming a hollow united body, said united body having a closed bottom wall and a substantially cylindrical circumferential wall, said body having a top wall, locking means adapted to releaseably secure said first and said second halves together maintaining said first and said second halves as a united body, said locking means including first and second lugs respectively secured to said first and said second halves on said circumferential wall the improvement which comprises:

said top wall including an essentially elongated opening opening into the hollow interior of said united body, said elongated opening formed in said first and said second halves such that a portion of said elongated opening is located in one of said first or said second halves and the remaining portion of said elongated opening is located in the other of said first or said second halves and together said portions form a singular opening in said top wall when said halves are associated together along said planar junction to form said united body;

said elongated opening sized and shaped to receive both sides of the shank of a lock of the type having a U-shaped shank the ends of which are received into a monolithic lock body, said lock body of the type which includes locking means incorporated into the lock body to reversibly release the ends of one of said shank sides;

the hollow interior of said body sized and shaped to contain at least said lock body within the interior of said body when the halves of said body are associated together along said planar junction forming said united body and when said lock body is contained within the interior of said body and said halves are associated together to form said united body said united body is capable of preventing access to said locking means of said lock body.

4,372,139

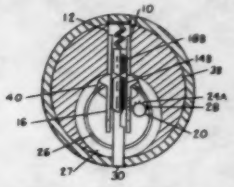
SELF-CONTAINED RE-KEYABLE LOCK

Dennis L. Lauke, 619 Willow Hill Ct., Florence, Ky. 41042

Filed Oct. 20, 1980, Ser. No. 198,911

Int. Cl.³ E05B 25/00

U.S. Cl. 70—383 **17 Claims**



1. A pin tumbler locking mechanism comprising at least one key pin housed in the main cylinder that aligns with at least one pin tumbler located in the housing for said main cylinder wherein the improvement comprises a means to adjust the shear line, at the location of said key pin and said pin tumbler and between said main cylinder and said housing for said main cylinder, and a means to rotate said main cylinder after said means to adjust the shear line has been engaged.

4,372,140

DEVICE FOR SHOT-BLASTING HOLLOW PARTS OF LARGE DIMENSIONS

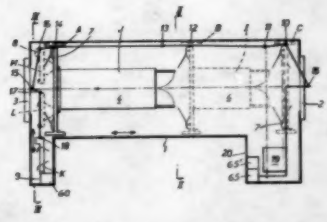
Bernard Sandillon, Maurepas, France, assignor to Lutelec Luchaire Equipement, Montreuil, France

Filed Jul. 8, 1980, Ser. No. 166,915

Claims priority, application France, Jul. 9, 1979, 79 17754

Int. Cl.³ B24C 1/10

U.S. Cl. 72—53 **10 Claims**



1. An installation for shot-blasting hollow parts of large dimensions, comprising:

a sealed enclosure,

displacement means for the hollow parts to be shot-blasted,

a plurality of blast pipes disposed in the enclosure,

a shot-blasting panel, movable in a direction perpendicular to the longitudinal axis of the enclosure and retractable in a lateral recess in the enclosure, said panel composed of at least one of said plurality of blast pipes,

a shot-blasting gantry, movable in the longitudinal axis of the enclosure, composed of at least one of said plurality of blast pipes,

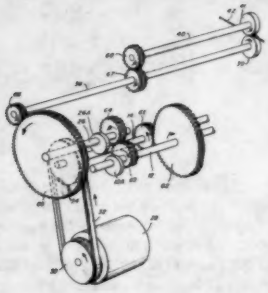
means for switching over an air-shot mixture between at least the gantry and the panel, and

means for controlling the movement of the blast pipes composing the shot-blasting gantry.

4,372,141
WIRE COILING MACHINE

Frank S. Russell, Northboro, and Robert J. Simonelli, Grafton, both of Mass., assignors to Sleeper & Hartley Corp., Worcester, Mass.

Filed Oct. 27, 1980, Ser. No. 201,204
Int. Cl.³ B21F 3/02, 11/00
U.S. Cl. 72—131 21 Claims



1. In a wire coiling machine having a work station at which a coil spring or the like is formed and a feed roller means through which the wire is fed, the improvement comprising;

means for driving said feed roller means at a variable drive speed to, in turn, feed the wire at a variable speed to the work station,

and means for controlling wire feed to intermittently interrupt wire feed in synchronism with the cutting of the wire subsequent to the coiling thereof,

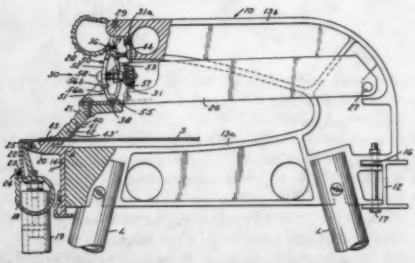
said means for driving comprising means for controlling the speed of wire feed to have a maximum speed feed while coiling and decreasing to a minimum speed feed in synchronism with the intermittent interruption of wire feed,

said means for driving comprising a drive source and non-circular gear means coupled intermediate the drive source and feed roller means.

4,372,142
SHEET BENDING BRAKE

James J. Rhoades, Garden City, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.

Filed Nov. 28, 1980, Ser. No. 211,463
Int. Cl.³ B21D 5/04, 11/04
U.S. Cl. 72—319 12 Claims



1. A sheet bending brake comprising

a frame having a fixed jaw and a movable jaw;

an anvil member secured to said fixed jaw;

said movable jaw having a clamping surface movable between workpiece clamping and non-clamping positions relative to the anvil member;

means for releasably locking the movable jaw in workpiece clamping position;

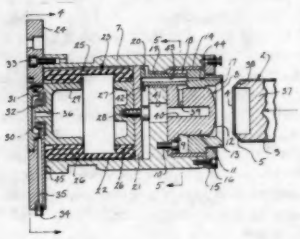
a bending member hingedly connected to the fixed jaw; and

a generally oval shaped spring device comprising generally U-shaped extruded upper and lower links, each link including a front wall and a rear wall connected to one another, each front and rear wall having a free end, the free ends of the front walls of said links extending toward one another and being pivoted to one another and the free ends of the rear walls of said links being spaced from one another, and means extending between at least one front wall and said rear walls for varying the spring force of said spring device, means pivoting the upper link of said spring device at the juncture of the front and rear wall thereof to said means releasably locking said jaw about an axis parallel to the axis about which the front walls are pivoted, means pivoting the lower link of said spring device at the juncture of the front and rear wall thereof to said movable jaw about an axis parallel to the axis about which the front walls are pivoted.

4,372,143
APPARATUS FOR FORMING A DOMED BOTTOM IN A CAN BODY

Karl Elert, Brookfield, and John C. Westphal, Franklin, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Oct. 10, 1980, Ser. No. 195,742
Int. Cl.³ B21D 22/24
U.S. Cl. 72—343 9 Claims

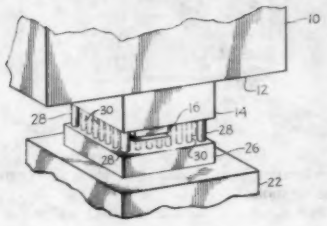


1. An apparatus for forming an inwardly extending dome in the bottom wall of a metallic one-piece can body having a beveled peripheral edge bordering the bottom wall, comprising, a die having an outer convex surface disposed to engage the bottom wall of the can body to form the dome therein, a pressure ring having an annular beveled surface and disposed radially outward of the die and mounted for sliding movement relative to said die, a pressure member spaced longitudinally from said die, a gas spring assembly including a single flexible bag interconnecting the pressure ring having an annular beveled surface and and the pressure member, said bag being disposed coaxially of said die, and an annular pressure transmitting member interconnecting said die and said pressure member, said pressure transmitting member disposed radially outward of said gas spring assembly and enclosing said bag, engagement of the beveled edge of said can body with the beveled surface on the pressure ring causing said pressure ring to move relative to said die against the pressure within said gas spring assembly to provide substantially uniform resistance throughout the stroke of movement of said pressure ring, and engagement of the bottom wall of the can body with said convex die surface serving to form the dome in said bottom wall.

4,372,144
WRAP RING ASSEMBLY FOR PRECISION NO-DRAFT FORGING

John J. Valentine, 1518 E. McWood St., West Covina, Calif. 91791, and Julius J. Fera, 17796 Fairview Dr., Fontana, Calif. 92335

Filed Apr. 27, 1981, Ser. No. 257,894
Int. Cl.³ B21D 22/00
U.S. Cl. 72—352 9 Claims

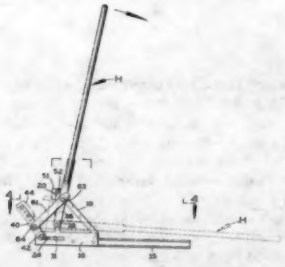


1. A wrap ring assembly for cooperation with an associated forging press which comprises:
- a punch having a first cavity;
- means for moving said punch up and down which includes a punch holder;
- a wrap ring having a bore therein;
- means for carrying said wrap ring on said punch holder which allows relative motion therebetween and which includes biasing means for urging said punch holder and said wrap ring apart; and
- a wrap die dimensioned for cooperation with said punch and having an exterior surface dimensioned for cooperation with said bore of said wrap ring.

4,372,145
CONDUIT BENDING APPARATUS

Anthony P. Giordano, 460 Mill Springs La., Plantation Acres, and Michael G. Mauer, Jr., 11780 Hermitage Dr., Plantation, both of Fla. 33325

Filed Mar. 30, 1981, Ser. No. 248,855
Int. Cl.³ B21D 9/05
U.S. Cl. 72—387 7 Claims

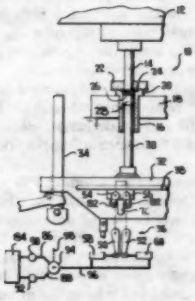


1. An apparatus for bending a plurality of closely spaced conduits extending up from a floor, said apparatus comprising:
- a base;
- means providing a lower abutment on one side of the conduits;
- means providing an upper abutment on said one side of the conduits spaced above and behind said lower abutment;
- a jaw mounted to be located on the opposite side of the conduits and movable between a retracted position away from said upper abutment and an extended position toward said upper abutment and above said lower abutment;
- and means for moving said jaw from said retracted position to said extended position to form lower bends in the conduits against said lower abutment in one direction and to form upper bends in the conduits against said jaw in the opposite direction from said lower bends, whereby to offset the upper ends of the conduits substantially parallel to their lower ends at the floor;
- said jaw having a width to receive all of said plurality of conduits simultaneously and a plurality of conduit-receiving grooves which are spaced apart laterally across said jaw to define the lateral spacing between the upper ends of said conduits above said upper bends therein;
- means on said base for adjusting said lower abutment means toward or away from said jaw at the front of said upper abutment means so as to change the amount of the offset formed in the conduits by said lower and upper bends therein;
- and means on said upper abutment means presenting a plurality of vertical grooves which are aligned respectively with said grooves in said jaw to further position the upper ends of said conduits.

4,372,146
PRESS MOTION DAMPENER

Donald E. Miller, Mt. Prospect, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 12, 1980, Ser. No. 206,194
Int. Cl.³ B21D 22/10
U.S. Cl. 72—453.13 9 Claims



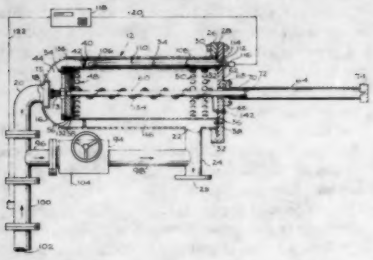
1. In a damper for dampening the travel of a moving member, said dampener comprising a pair of fluid motors having opposed operating elements, an actuating arm coupled to each of said operating elements, a reciprocating cam member operatively connected to said moving member, and means cooperative with said cam member for simultaneously moving said actuating arms in opposite directions against the resistance of said fluid motors, said cam member having remote oppositely facing surfaces including cam surfaces, and said means cooperative with said cam member being a pair of opposed cam followers engageable with said oppositely facing surfaces, said oppositely facing surfaces including cam follower engageable surfaces which are parallel and are after said cam surfaces in the direction of travel of said cam member.

4,372,147

FLOW METER PROVER APPARATUS AND METHOD

Charles C. Waugh, Tarzana, and Robert L. Wehrli, Malibu, both of Calif., assignors to Waugh Controls Corporation, Chatsworth, Calif.

Filed Mar. 17, 1981, Ser. No. 244,790
Int. Cl.³ G01F 25/00
U.S. Cl. 73—3 16 Claims



1. Apparatus for measuring a quantity of a flowing fluid, comprising:

an outer fluid housing having upstream and downstream ends, an inlet communicating with the upstream end and an outlet communicating with the downstream end;

a measuring conduit;

means for coaxially mounting the conduit within the outer housing, forming an annular cavity between the conduit and the housing;

a fluid barrier;

means for mounting the barrier within the annular cavity in a manner which divides the cavity into upstream and downstream sections;

a controllable piston slidably mounted within the conduit and having upstream and downstream sides;

an actuating rod axially projecting from the downstream side of the piston, where the free end of the rod extends through the downstream end of the outer housing;

first fluid bypass means connected between the inlet and outlet of the outer housing whereby the fluid can bypass the outer housing when the bypass is open;

first and second piston detection means;

means for positioning the first and second detection means in a spaced apart relationship where the distance between the first and the second detection means corresponds to the length of the fluid measuring portion of the conduit; and

second fluid bypass means including a first set of apertures provided in the conduit adjacent the upstream end thereof, and a second set of apertures provided in the conduit adjacent the downstream end thereof, whereby the fluid can bypass the piston when the piston is located at either the upstream or downstream limits of its travel within the conduit, and where the measuring portion of the conduit lies between the first and second sets of apertures; and where the means for coaxially mounting the conduit within the outer housing are located at positions of the conduit which exclude the fluid measuring portion of the conduit, so that the entire inner and outer surface of the fluid measuring portion of the conduit may be exposed to the fluid.

4,372,148

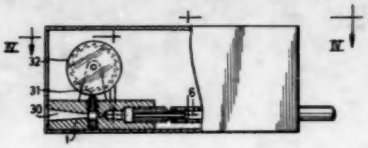
GENERATING APPARATUS FOR A VARIABLE FLUID PRESSURE

Bertrand G. Cleutat, 2 rue Marie Benaist, 75012 Paris, France

Filed Oct. 1, 1980, Ser. No. 192,939
Int. Cl.³ G01L 27/00
U.S. Cl. 73—4 R 3 Claims

1. Apparatus for generating a pulsating fluid pressure, the pulsation frequency itself being variable in a continuous manner, comprising:

a supporting structure; a conduit supported by said structure, with an ingress perforation for connecting a source of fluid under constant pressure thereto, an exit perforation continuously connected to said conduit where the pulsating fluid pressure exits, and an intermediate outlet



perforation in said conduit between said ingress and exit perforations,

a rotating cam with an inertia wheel, and means for launching rotation, and

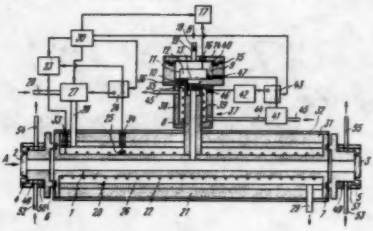
movable means for at least partially closing the outlet perforation, operatively connected to said rotating cam in a manner so as to create at least an opening-closing cycle of said closing means at each turn of the cam.

4,372,149

LASER-EXCITED SPECTROPHONE

Vladimir P. Zharov, ulitsa Svobody, 48, korpus 1, kv. 8, Moscow, U.S.S.R.

Filed Nov. 17, 1980, Ser. No. 207,278
Int. Cl.³ G01N 21/00
U.S. Cl. 73—24 14 Claims



1. A laser-excited spectrophone comprising:

a working chamber whose cavity is formed with walls having inner and outer sides and also with first and second butt ends, said cavity being filled with a sample gas;

a first optical window in the first butt end of said chamber, laser radiation being transmitted to said chamber through said window;

a second optical window in the second butt end of said chamber, said window being used to remove said laser radiation from said chamber;

a conduit formed with walls having outer and inner sides, which is in communication with the cavity of said working chamber and has a length exceeding 8 to 10 times its cross-sectional diameter, while a volume thereof is at least 50 times smaller than the volume of said working chamber;

a condenser microphone mounted in said conduit; and

a first means for controlling temperature of said sample gas in said working chamber by its heating, said means incorporating an individual temperature control element encompassing said outer side of said walls of said chamber, a temperature transducer of said chamber arranged on

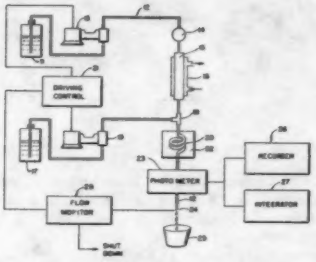
said outer side of said wall of said chamber, and an individual thermoregulator having a first input and an output and connected via its input to said temperature transducer of said chamber and via its output to the temperature control element thereof.

4,372,150

FLOW MONITORING METHOD AND APPARATUS

Donald E. Stephens, Palo Alto, and Robert J. Ehret, Los Altos, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 5, 1980, Ser. No. 156,718
Int. Cl.³ G01M 3/28
U.S. Cl. 73—40.5 R 5 Claims



1. Apparatus employed with a liquid chromatograph instrument, said instrument including a chromatographic column, said device comprising:

means, associated with said column, for pumping a liquid;

a voltage controlled oscillator cooperative with said pumping means;

a drop detector associated with said chromatographic column;

means, adapted to receive a count signal from said voltage controlled oscillator and a clocking signal from said drop detector, for accumulating said count signal from said voltage controlled oscillator during a time determined by said clocking signal from said drop detector; and

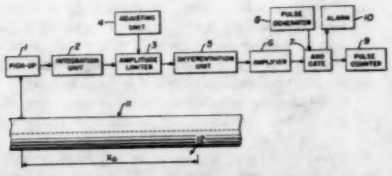
means, responsive to said accumulating means, for comparing said accumulated counting signal with a preselected reference number.

4,372,151

AUTOMATIC FAULT LOCATING APPARATUS FOR A PRESSURIZED PIPELINE

Gennady A. Muraviev, Keskuse, 20, kv. 20, Tallin, and Lev B. Kublanovsky, Festivalnaya, 31, kv. 63, Moscow, both of U.S.S.R.

PCT No. PCT/SU80/00049, § 371 Date Nov. 13, 1980, § 102(e) Date Nov. 13, 1980, PCT Pub. No. WO80/01942, PCT Pub. Date Sep. 18, 1980
PCT Filed Mar. 13, 1980, Ser. No. 216,999
Claims priority, application U.S.S.R., Mar. 13, 1979, 2729652
Int. Cl.³ G01M 3/24
U.S. Cl. 73—40.5 A 3 Claims



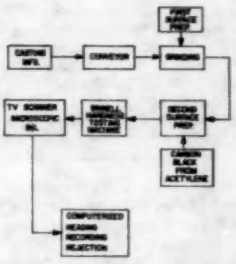
1. An automatic leak locating apparatus for a pressurized pipeline, comprising a pick-up for converting acoustic vibrations due to a leak into electrical signals and having an output electrically associated with an input of an amplifier having its output connected to one of the inputs of an AND gate, the AND gate having its other input connected to a pulse generator, whose frequency is equal to a proportionality factor K corresponding to the duration of a leading edge of a pressure drop level at a limit level and the distance covered thereby, a pulse counter to which an output of the AND gate is connected, characterized in that it further comprises an integration unit (2) to integrate said signals and having an input connected to an output of the pick-up to receive said signals (1), an amplitude limiter (3) having a signal input connected to receive an output of the integration unit (2), a limit level adjusting unit (4) whose output is connected to a control input of the amplitude limiter (3), a differentiation unit (5) having an input connected to receive an output of the amplitude limiter (3), and an output of said differentiation unit being connected as an input to the amplifier (6).

4,372,152

BRINELL HARDNESS MEASURING SYSTEM

Edwin B. Lewis, Evington, and Roy N. Moore, Jr., Concord, both of Va., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 19, 1981, Ser. No. 226,301
Int. Cl.³ G01N 3/42, 21/01
U.S. Cl. 73—81 2 Claims



1. A process for automatically measuring the Brinell hardness of a casting for the purpose of creating data for use in making an accept/reject decision comprising the steps of:

(a) selecting at least one surface of a casting for hardness testing and positioning said casting on retaining means such that said surface is properly aligned for surface preparation steps and the use of Brinell hardness testing apparatus;

(b) subjecting said surface to a first surface preparation step, said first surface preparation step consisting of abrasive grinding or machining of at least a portion of the selected surface to remove irregularities in said surface;

(c) subjecting said surface to a second surface preparation step which comprises applying a contrast enhancing material to at least a portion of said selected surface of said casting, said contrast enhancing material being selected from the group consisting of flat black paint, glass frosting, colloidal graphite, carbon black and combinations of the above;

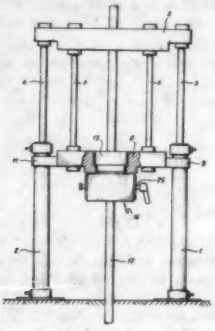
(d) testing the Brinell Hardness testing apparatus; and

(e) using the Brinell Hardness data to automatically effect an accept/reject decision and computing a Brinell number, as to the suitability of said casting for its intended use.

4,372,153
PIPE CLAMP AND A PROBING DEVICE COMPRISING A PIPE CLAMP

Adriaan B. Mann, Delft, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

PCT No. PCT/NL80/00010, § 371 Date Dec. 3, 1980, § 102(e) Date Dec. 2, 1980, PCT Pub. No. WO80/02174, PCT Pub. Date Oct. 16, 1980
PCT Filed Apr. 3, 1980, Ser. No. 220,051
Claims priority, application Netherlands, Apr. 3, 1979, 7902608
Int. Cl.³ G01N 3/02
U.S. Cl. 73—84 8 Claims

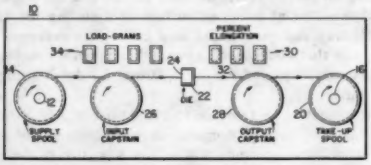


1. A pipe clamp comprising: a housing having a cylindrical inner wall and an opening for passing therethrough a pipe to be clamped, two guide blocks accommodated within said housing and each having a sliding surface running obliquely with respect to the axis of said opening, and two clamping blocks respectively capable of cooperating with the oblique sliding surfaces of said guide blocks, the axes of the cylindrical inner wall of the housing and of the opening being substantially perpendicular with respect to each other, and said two guide blocks being rotatable over 180° within said housing.

4,372,154
WIRE ELONGATION TEST METHOD AND APPARATUS

Lawrence W. Corbin, Fort Wayne, Ind., assignor to Fort Wayne Wire Die, Inc., Fort Wayne, Ind.

Filed May 22, 1981, Ser. No. 266,600
Int. Cl.³ G01N 19/00
U.S. Cl. 73—104 12 Claims

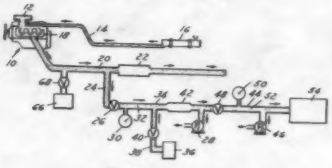


1. A digital method of testing a wire drawing die to determine the percent wire elongation provided thereby when the elongation is less than 100% comprising the steps of: pulling a predetermined test length of wire through the die and then around a rotatable capstan thereby rotating the same, generating a train of electrical pulses in response to rotational movement of said capstan, there being 10^n pulses generated in response to the rotational movement of said capstan caused by pulling a length of drawn wire therearound equal in length to said test length where "n" is a positive integer greater than zero and less than five; counting said pulses during the pulling of said test length of wire through the die; and providing a visual indication of the pulse count with the most significant digit eliminated.

4,372,155
METHODS OF MONITORING A COMBUSTION SYSTEM

James W. Butler, Dearborn Heights; Alex D. Colvin, Oak Park, and Dennis Schuetzle, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 20, 1981, Ser. No. 265,316
Int. Cl.³ G01M 15/00
U.S. Cl. 73—114 7 Claims



1. A method of obtaining on a continuous basis an instantaneous indication of the air to fuel ratio of an air/fuel mixture being fed to a combustion process, which method comprises the steps of:

continuously passing an air/fuel mixture through a combustion process to generate a first stream of gaseous material which may contain (a) unburned fuel, (b) partially oxidized fuel, (c) carbon monoxide, (d) carbon dioxide, (e) water vapor, (f) nitrogen, (g) oxygen, (h) inert gases normally found in air, or (i) a mixture of any or all of (a) through (h);

continuously withdrawing into a volume at a first pressure below atmospheric pressure a sample portion of said first stream of gaseous material, said first pressure below atmospheric pressure being a pressure that, at the temperature of said sample portion continuously withdrawn, said water vapor contained therein will not condense, said sample portion continuously withdrawn forming a second stream of gaseous material that has the same compositional makeup on a volume percentage basis as said first stream of gaseous material but at a reduced pressure;

continuously providing a controlled source of oxygen addition to said second stream of gaseous material;

continuously controlling said controlled source of oxygen addition by application of a control signal thereto in a manner that said oxygen is added to said second stream of gaseous material at a rate proportional to the strength of said control signal applied to said controlled source of oxygen addition;

continously developing said control signal to a strength which results in said controlled source of oxygen addition adding to said second stream of gaseous material sufficient oxygen that there is after oxygen addition a predetermined amount of oxygen in excess of that required to stoichiometrically oxidize any (a) unburned fuel, (b) partially oxidized fuel, and (c) carbon monoxide to (d) carbon dioxide and (e) water vapor;

continuously withdrawing into a volume at a second pressure substantially below said first pressure a sample portion of said second stream of gaseous material after said oxygen has reacted with (a) unburned fuel, (b) partially oxidized fuel, and (c) carbon monoxide, said second pressure being a pressure that, at the temperature of said sample portion continuously withdrawn from said second stream of gaseous material, said water vapor contained therein will not condense, said sample portion continuously withdrawn forming a third stream of gaseous material that has the same composition makeup based on fully oxidized carbon and hydrogen on a molar basis as said

second stream of gaseous material plus added oxygen but at a reduced pressure;

continuously subjecting said third stream of gaseous material to analysis by a mass spectrometer to generate on a continuous basis on output signal indicative of the ratio of oxygen to nitrogen in said third stream of gaseous material; and

continuously generating from said output signal generated by said mass spectrometer said control signal for application to said controlled source of oxygen, said control signal strength being generated in a manner that (1) when the oxygen signal of said third stream of gaseous material being measured by said mass spectrometer is at a predetermined level said control signal strength has a predetermined strength which ensures said predetermined amount of oxygen in excess of that required to stoichiometrically oxidize the aforementioned components is added to said second stream of gaseous material, and (2) when said oxygen signal of said third stream of gaseous material being measured by said mass spectrometer falls away from said predetermined level said control signal has a strength that ensures an amount of oxygen greater than said predetermined amount of oxygen is added to said second stream of gaseous material so that said measured amount of oxygen is returned to said predetermined level of oxygen, the instantaneous amount of oxygen being added to said second stream of gaseous material and the oxygen to nitrogen ratio being related to the fuel to air ratio of said air/fuel mixture being burned in the combustion process.

4,372,156

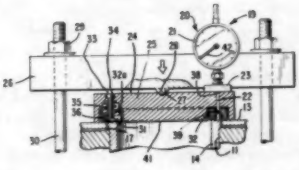
METHOD AND APPARATUS FOR DETERMINING CYLINDER LINER PROJECTION

Richard A. Meismer, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 17, 1981, Ser. No. 235,214

Int. Cl.³ G01M *15/00*; **F02F** *1/10*; **B23P** *19/02, 15/00*

U.S. Cl. 73—119 R **21 Claims**



1. The method of determining the amount of projection of a cylinder liner (**14**) received in a cylinder block bore (**11**) of a cylinder block structure (**10**) and having an upper end (**15**) extending to above a top surface (**13**) of the cylinder block structure, said method comprising the steps of:

providing a pressure plate (**25**) having an accurately flat top surface (**24**) defining a reference plane;

positioning the pressure plate against said top surface (**13**) of the cylinder block structure;

urging the cylinder liner (**14**) fully about the circumferential extent thereof into fully inserted relationship in the cylinder block bore (**11**);

providing a gage indicator (**20**) having a base (**23**) and a probe (**22**) extending downwardly from said base;

positioning said indicator base (**23**) on said pressure plate top surface (**24**) to have the probe extend into engagement with said urged cylinder liner upper end (**15**) to provide a first reading from said reference plane; and

positioning the indicator base (**23**) on said pressure plate top surface (**24**) to have said probe extend into engagement with said top surface (**13**) of the cylinder block structure to provide a second reading from said reference plane which when compared with said first reading indicates the amount of projection of said upper end beyond said top surface of the cylinder block structure.

4,372,157

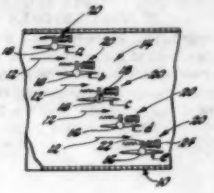
AERODYNAMIC DATA COLLECTION PROCEDURE

John E. Caruthers, Tullahoma, Tenn.; Robert L. Jay, Indianapolis, Ind.; Ronald E. Riffel, Indianapolis, Ind., and Mark D. Rothrock, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1981, Ser. No. 251,907

Int. Cl.³ G01M *9/00*

U.S. Cl. 73—147 **3 Claims**



1. A procedure for collecting experimental data reflecting the behavior of a time varying aerodynamic parameter at an airfoil in a cascade of harmonically vibrating airfoils comprising the steps of placing said cascade of airfoils in a wind tunnel, subjecting said cascade to a continuous steady state fluid stream in said wind tunnel, vibrating a center airfoil of said cascade at a selected frequency and a selected amplitude while all of the other of said airfoils in said cascade are held rigid, measuring a time varying parameter at said center airfoil during vibration thereof, vibrating in turn and in said fluid stream each of said other airfoils at said selected frequency but at an arbitrarily selected amplitude which all of the remaining airfoils in said cascade including said center airfoil are held rigid, measuring said time varying parameter at said center airfoil during vibration of each individual one of said airfoils, and combining all of said time varying parameter measurements to reflect the behavior of said time varying parameter at said center airfoil when all of said airfoils in said cascade including said center airfoil are vibrated harmonically at said selected frequency and at the same amplitude.

4,372,158

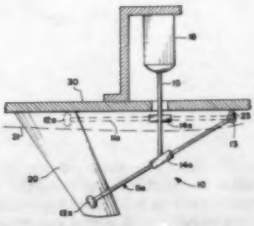
AEROELASTIC INSTABILITY STOPPERS FOR WIND TUNNEL MODELS

Robert V. Doggett, Jr., Hampton, and Rodney H. Ricketts, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 17, 1981, Ser. No. 274,705

Int. Cl.³ G01M *9/00*

U.S. Cl. 73—147 **11 Claims**



1. A device for constraining and forestalling destructive

aeroelastic vibrations in models being wind tunnel tested comprising:

a wind tunnel having walls forming a test section;

a model mounted in said wind tunnel test section;

restraining means;

said restraining means being connected to test section structure and being movable from a positon against a wall of the test section to a position engaging said model; and

actuation means for controllably deploying said restraining means when said model is subjected to excessive vibrations.

4,372,159

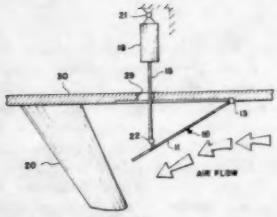
AEROELASTIC INSTABILITY STOPPERS FOR WIND TUNNEL MODELS

Robert V. Doggett, Jr., Hampton, and Rodney H. Ricketts, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 17, 1981, Ser. No. 274,706

Int. Cl.³ G01M 9/00

U.S. Cl. 73—147 12 Claims



1. A device for diverting the flow over a model aircraft in a wind tunnel test comprising:

wind tunnel means having walls forming a test section;

plate means associated with a wall of the test section;

pivoting means for connecting said plate means to the wall of the wind tunnel; and

actuation means for controllably deploying said plate means into said test section to divert flow from a model being tested therein preventing instability of the model.

4,372,160

SPHERICAL INDICATORS FOR AIRCRAFT

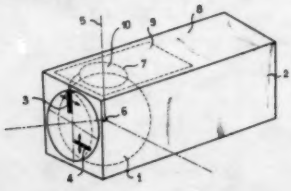
Guy Gogniat, Linas, and Jacques Grobois, Palaiseau, both of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), France

Filed Nov. 13, 1980, Ser. No. 206,530

Claims priority, application France, Nov. 20, 1979, 79 28568

Int. Cl.³ G01C 21/00

U.S. Cl. 73—178 R 8 Claims



1. A spherical indicator for the position of an aircraft, comprising a pointer, a member supporting the pointer which member is mounted to rotate whereby the pointer can move in front of a sphere in order to illustrate a variation between the position of the aircraft and a guide line, said member being mounted to rotate about an axis which passes through the centre of the sphere, said member comprising a ring centered on an axis of the sphere, and said ring being located substantially in a plane tangential to the sphere.

4,372,161

PNEUMATICALLY OPERATED PIPE CRAWLER

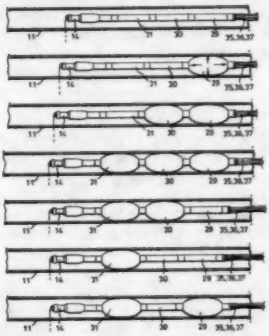
Eric G. de Buda, 55 Humberview Rd., Toronto, Ontario, Canada (M6S 1W7); John R. Boon, 431 Satok Crescent, Milton, Ontario, Canada (L9T 3P2), and Michael P. Dolbey, 5 Glen Robert Dr., Toronto, Ontario, Canada (M4B 1J4)

Filed May 4, 1981, Ser. No. 260,012

Claims priority, application Canada, Feb. 25, 1981, 371711

Int. Cl.³ G01N 29/04

U.S. Cl. 73—432 R 9 Claims



1. A pneumatically operated pipe crawler for transporting inspection equipment along the interior of a pipe, comprising:

an elongate cylindrical tube of flexible resilient material, the tube having a leading end and a trailing end,

support means extending from the leading end of the tube for supporting the inspection equipment ahead of the tube,

a plurality of longitudinally spaced partition members located within the tube, said members being hermetically sealed to the wall of the tube and defining therein first, second and third longitudinally separated chambers each having a radially and axially extensible wall portion,

first, second and third flexible gas supply tubes extending from the trailing end of the tube and communicating respectively with said chambers for inflating and deflating the chambers,

flexible electrical signalling means extending interiorly of the tube, said signalling means extending from the leading end of the tube for connection to the inspection equipment and extending from the trailing end of the tube for connection to a signal receiver,

said gas supply tubes and signalling means being hermetically sealed to the partition members through which they pass, and

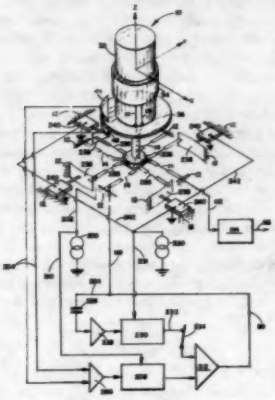
means for supplying gas to said chambers and exhausting gas therefrom in repeated cyclic sequence for sequentially expanding said chamber wall portions into clamping relation with the pipe, each wall portion recovering to its original axial length upon deflation of the chamber, thereby to propel the tube step by step along the pipe.

4,372,162

THREE-AXIS ACCELEROMETER HAVING DYNAMIC BIAS COMPENSATION

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,545
Int. Cl.³ G01P 15/125
U.S. Cl. 73—517 B 10 Claims



1. An accelerometer, comprising:

a base;

a proof mass;

primary control means for maintaining the position of said proof mass relative to said base, wherein said primary control means produces an output signal proportional to acceleration of said proof mass and base;

elastic suspension means for means for maintaining the position of said proof mass relative to said base;

means for producing a periodic variation of stress in said elastic suspension means and a corresponding periodic variation proportional to bias in said output signal; and

means for sensing said periodic variation proportional to bias and for using said periodic variation proportional to bias to provide dynamic bias compensation or calibration.

4,372,163

ACOUSTIC MEASUREMENT OF NEAR SURFACE PROPERTY GRADIENTS

Bernhard R. Tittmann; Lloyd A. Ahlberg, and Richard K. Elsley, all of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 3, 1981, Ser. No. 231,061
Int. Cl.³ G01N 29/00
U.S. Cl. 73—602 9 Claims

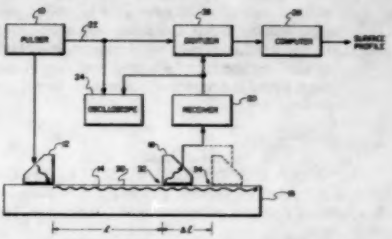
1. A method for determining the dispersion of a surface acoustic wave in an object, comprising the steps of:

generating a broadband acoustic wave in a surface of the object;

detecting the wave at a first location on the surface;

detecting the wave at a second location on the surface; and

calculating the velocity dispersion $v(f)=2\pi f\Delta l/a\phi(f)$ where f is the frequency component of the wave, Δl is the distance between the first and second locations, and $\Delta\phi(f)$ is



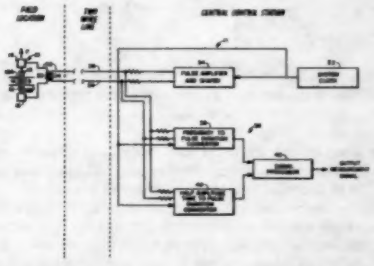
the change in phase of the frequency component f of the detected wave between the first and second locations.

4,372,164

INDUSTRIAL PROCESS CONTROL INSTRUMENT EMPLOYING A RESONANT SENSOR

Christopher R. Brown, and Everett O. Olsen, both of Wrentham, Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 2, 1980, Ser. No. 155,325
Int. Cl.³ G01L 9/00
U.S. Cl. 73—704 14 Claims



10. Industrial process instrument apparatus for developing at a central control station a signal responsive to the value of a process condition at a field measurement station remote from said central station, said process condition being represented at said measurement station by a differential pressure dependent upon the value of such condition;

said instrument comprising:

a vibrating wire located at said field measurement station said vibrating wire being surrounded by a liquid and having a resonant frequency and a damping factor, said resonant frequency and said damping factor both being dependent upon the differential pressure and the liquid temperature, said vibrating wire further capable of producing when excited a signal dependent upon both said resonant frequency and said damping factor, wherein when said vibrating wire is excited with a continuous wave of energy said signal has a frequency equal to said resonant frequency and a magnitude related to said damping factor;

a two-wire line for coupling said vibrating wire to said central control station;

said central control station including:

excitation means for supplying a continuous wave of energy to said vibrating wire;

first sensing means responsive to the frequency of said vibrating wire signal and for producing a signal dependent thereon;

second sensing means responsive to the magnitude of

said vibrating wire signal and for producing a signal dependent thereon;

said first sensing means signal and said second sensing means signal adapted to be combined in accordance with known physical principles to obtain an output measurement signal dependent only upon the value of said differential pressure and independent of the value of said temperature, whereby said output measurement signal is dependent only upon the value of said process condition.

4,372,165

APPARATUS FOR MEASURING FLUID FLOW

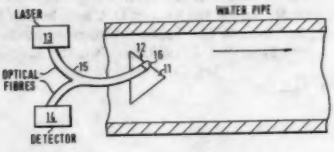
Gillies D. Pitt, Saffron Walden, and Roger J. Williamson, Harlow, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 10, 1980, Ser. No. 185,629

Claims priority, application United Kingdom, Sep. 11, 1979, 7931477

Int. Cl.³ G01F *1/32*; G01N *21/41*

U.S. Cl. 73—861.22 **4 Claims**



1. A fluid flowmeter of the type in which the flow velocity of a fluid is determined by measuring the frequency at which vortices are shed from a bluff body arranged in the fluid stream, comprising:

a prism mounted on said bluff body in the fluid stream;

a light source and means for directing light into said prism so as to provide an internally reflected beam;

means for measuring the intensity of said reflected beam; and

a frequency meter coupled to the output of said intensity measuring means to determine the rate of variation of said reflected beam intensity, said prism being constructed with respect to said light directing means so that the reflectivity of at least one surface of said prism varies in response to variations in the refractive index of the fluid caused by passing fluid vortices.

4,372,166

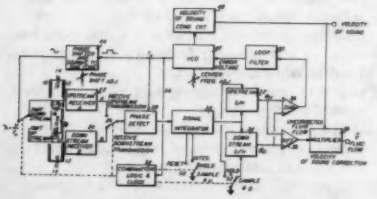
FLOWMETER SYSTEM WITH DIGITAL PHASE SHIFTER AND CALIBRATION

Robert S. Loveland, West Covina, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 13, 1981, Ser. No. 224,723

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **9 Claims**



1. A flowmeter system comprising, in combination:

transducer means for transmitting acoustic compression waves upstream and downstream in a fluid flowing in a path in response to transmit signals;

circuit means for measuring the phase difference between the transducer means in the fluid flow path of the acoustic compression waves transmitted upstream and circuit means for measuring the phase difference between said transducer means in the fluid flow path of the acoustic compression waves transmitted downstream;

circuit means for producing a difference signal dependent on the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction;

circuit means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path of the transducer means; and

digital means for generating calibration signals connected to said means for adjusting the frequency of the acoustic compression waves so as to simulate fluid flow in said path in response to signals from said transducer means and said means for adjusting the frequency of the acoustic compression waves for adjusting the phase of the transmit signals during initial calibration of the system to compensate for variations in transducer elements and to calibrate the system for use without the need of a flow in said path.

4,372,167

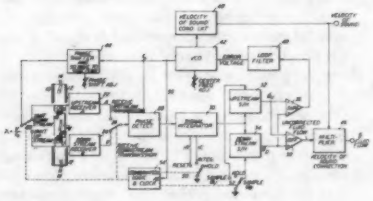
FLOWMETER SYSTEM WITH IMPROVED LOOP GAIN

Robert S. Loveland, West Covina, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 13, 1981, Ser. No. 224,724

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **10 Claims**



1. A flowmeter system of the phase lock loop type comprising, in combination:

transducer means for transmitting acoustic compression waves upstream and downstream in a fluid flowing in a path;

circuit means for measuring the phase difference between the transducer means in the fluid flow path of acoustic compression waves transmitted upstream and circuit means for measuring the phase difference between said transducer means in the fluid flow path of the acoustic compression waves transmitted downstream;

circuit means for producing a difference signal dependent on the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction;

circuit means for producing a sum signal representing the sum of the two phase differences;

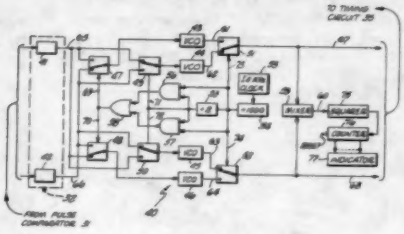
circuit means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path between the transducer means; and

active filter means connected between said summing means and automatic frequency adjusting means for filtering and increasing the amplitude of the sum signal so that relatively small difference signals produce large signals at said automatic frequency adjusting means to increase the loop gain of the system.

4,372,168
FLOWMETER

Christopher A. Watson, Upland, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,396
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 8 Claims



1. In an ultrasonic flowmeter, the combination comprising: a pipe section; a first transducer mounted in said pipe section to transmit and to receive vibrations along an axis; a second transducer mounted in said pipe section on said axis and spaced from said first transducer to transmit and to receive vibrational energy respectively transmitted to and from said first transducer; at least first and second voltage controlled oscillators having first and second output leads; means to cause said first and second voltage controlled oscillators to produce first and second output signals on said first and second output leads, respectively, of frequencies f_m and f_n, respectively, where

$$f_d = |f_m - f_n|$$

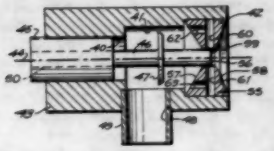
and f_d is proportional to the volume flow rate of a fluid flowing in said pipe section; difference means having first and second input leads; first switch means alternately connecting said first and second input leads from said first and second output leads, respectively, and vice versa, at a first rate to produce a third output signal of a frequency f_o, where $f_o = Kf_d$ and K is a constant, said difference means having a third output lead which carries said third output signal; utilization means connected from said third output leads; second switch means to energize said first and second transducers alternately at a second rate substantially higher than said first rate and synchronously with said first and second voltage controlled oscillators, respectively; and a charge storage circuit connected from respective ones of said second and first transducers, said charge storage circuit controlling the frequencies of said first and second voltage controlled oscillators.

4,372,169
VORTEX GENERATING MASS FLOWMETER

Nathaniel Hughes, Palm Springs, Calif., assignor to Vortech Sciences, Inc., Palm Springs, Calif.

Continuation-in-part of Ser. No. 40,557, May 21, 1979, Pat. No. 4,240,293, which is a continuation-in-part of Ser. No. 886,289, Mar. 13, 1978, Pat. No. 4,189,101, and Ser. No. 886,288, Mar. 13, 1978, Pat. No. 4,192,465, each is a continuation-in-part of Ser. No. 785,838, Apr. 8, 1977, Pat. No. 4,109,862. This application Jan. 7, 1980, Ser. No. 109,839
Int. Cl.³ G01F 1/32, 1/34
U.S. Cl. 73—861.52 16 Claims

1. A vortex generating flowmeter comprising:
a first port;
a second port;
a flow measurement passage between the first and the second ports;
a restriction formed in the flow passage between the first and second ports;
bluff body means producing drag in the passage between the restriction and the second port; and

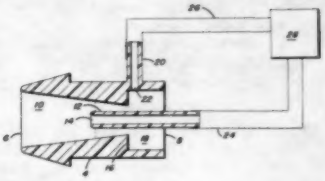


means for sensing gas pressure in the vicinity of the bluff body means between the restriction and the second port.

4,372,170
FLOW MEASURING APPARATUS

Marv L. Dehart, Mesquite; M. Leon Kloostra, Rowlett, and Harold E. Straub, Garland, all of Tex., assignors to Environmental Elements Corp., Baltimore, Md.

Filed Nov. 7, 1977, Ser. No. 849,403
Int. Cl.³ G01F 1/42; G01F 1/46
U.S. Cl. 73—861.61 2 Claims

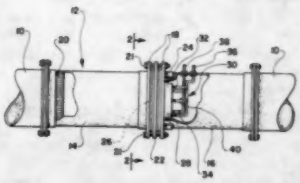


1. A gas flow sensing device comprising a tube having an upstream end and a downstream end, the orifice in the upstream end being tapered to form a tapered orifice section, an abrupt expansion of the orifice to form an expansion chamber in the downstream end, a total pressure probe located in the tapered orifice section and having its opening parallel to the flow of gas and facing upstream, a static pressure probe located in the expansion chamber at the abrupt expansion of the orifice and having its opening perpendicular to the flow of gas, means for connecting the total pressure probe and static pressure probe to a visual readout means or a control means.

4,372,171
NOZZLE PITOT AVERAGING PRIMARY

Robert O. Brandt, Jr., Garner, N.C., assignor to Brandt Industries, Inc., Fuquay-Varina, N.C.

Filed Oct. 14, 1980, Ser. No. 196,184
Int. Cl.³ G01F 1/46
U.S. Cl. 73—861.66 14 Claims



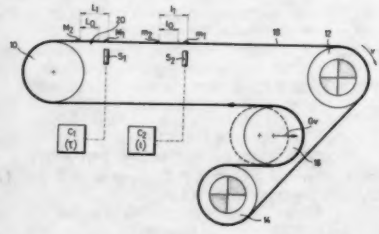
1. A nozzle pitot primary device for measuring air or gas flow within a system of air or gas fluid moving within a conduit comprising: fluid constricting means in the form of a nozzle having a longitudinal axis and an external wall that

defines a fluid flow opening therein for allowing a fluid such as air or gas to pass therethrough and further including an inlet end and an exiting end and wherein the external wall of said nozzle is flared inwardly from said inlet end towards said exiting end such that fluid is constricted as it passes therethrough, said nozzle being adapted to be positioned with respect to said conduit such that fluid passing through said conduit is constrained to move through said nozzle; pitot means operatively associated with said nozzle and positioned in the path of the fluid passing therethrough for effectively sensing the differential velocity pressure of the fluid passing through said nozzle, said pitot means including an array of averaging static and total pressure pitots disposed in a loop type configuration about said nozzle with pitots of said array having sensing ends that generally lie in a transverse plane inwardly of the external wall of said nozzle; said total pressure pitots including a plurality of openings spaced and disposed along the loop configuration with the openings being oriented to face the flow within said nozzle; said static pitots including a plurality of openings spaced and disposed along said loop configuration but which are oriented such that they face a direction generally perpendicular to the direction of flow within said nozzle; said loop configuration extending around the central axis of said nozzle and spaced inwardly of the adjacent external wall structure and wherein openings of both said static and total pressure pitots lie along the same loop configuration; and wherein said nozzle is shaped to provide flow constricting means for directing the system of fluid therethrough in such a manner that the resulting velocity profile of the moving fluid is relatively uniform across a substantial portion of the cross sectional area of the fluid flow opening within said nozzle, thereby enabling a relatively accurate determination of fluid flow to be made.

4,372,172
PROCESS FOR MEASURING THE TIGHTNESS OF ENDLESS DRIVING MEANS DURING OPERATION

Karoly Gombocz; Jozsef Korbuly; Geza Krampe; Jozsef Szatmari, all of Budapest, and Karoly Szöke, Kerepestarcsa, all of Hungary, assignors to Kozponti Banyaszati Fejlesztesi Intezet, Budapest, Hungary

Filed Oct. 4, 1980, Ser. No. 204,081
Int. Cl.³ G01L *5/10*
U.S. Cl. 73—862.39 **2 Claims**



1. A method of monitoring ageing or wearing condition of a spliced endless driving means, which method comprises applying to a spliced endless driving means a pair of first markings (M_1, M_2) the shortest path between which includes the splice of the endless drive means, applying to said driving means a pair of second markings (m_1, m_2) the shortest path between which does not include said splice, measuring substantially simultaneously during use of the driving means:

(1) the time taken for said first pair of markings to pass through a position in which they are sensed by a first element (S_1) for sensing the presence of said first markings; and

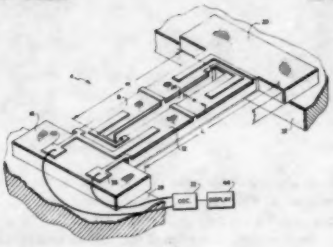
(2) the time taken for said second pair of markings to pass through a position in which they are sensed by a second element (S_2) for sensing the presence of said second markings;

thereafter determining the relation between times (1) and (2) and comparing the relation thus obtained with a permitted relation value.

4,372,173
RESONATOR FORCE TRANSDUCER

Errol P. EerNisse, Sandy, Utah, and Jerome M. Paros, Redmond, Wash., assignors to Quartex, Inc., Salt Lake City, Utah

Filed Oct. 20, 1980, Ser. No. 198,705
Int. Cl.³ G01L *1/10*
U.S. Cl. 73—862.59 **22 Claims**



1. A vibratory force transducer comprising

a pair of elongate, generally parallel bars coupled together at their ends and adapted to vibrate 180° out of phase in a transverse direction, said bars each having a thickness t and a width w, the distance between the locations at which the bar ends are coupled together being m and the lengths of the bars being generally L, wherein

$0.4 < t/w < 4$, and

$L/m \geq 1$,

means for causing said bars to resonate at a frequency f in substantially 180° phase opposition in a transverse direction, said frequency varying with variation in force applied longitudinally to said bars.

4,372,174
METHOD AND APPARATUS FOR SAMPLING A CORE OF TAR SAND

Lubomyr M. Cymbalisty; Alvin J. Maskwa; Lloyd W. Trevoy, and Jan Wojno, all of Edmonton, Canada, assignors to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; PanCanadian Petroleum Limited, Calgary; Esso Resources Canada Ltd., Calgary; Canada-Cities Service, Ltd., Calgary; Gulf Canada Limited, Calgary; Alberta Energy Company Ltd., Calgary; Hudson's Bay Oil and Gas Company Limited, Calgary and Petrofina Canada Inc., Calgary, all of, Canada

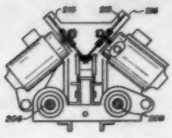
Filed May 4, 1981, Ser. No. 260,365
Int. Cl.³ G01N *1/04*
U.S. Cl. 73—863.11 **3 Claims**

1. A method for sampling a frozen core of tar sand which comprises:

cutting the core transversely to form a pair of slabs, each having a flat face and a curved face;

sawing a pair of angularly directed cuts into the central portion of such a slab along at least part of its length to

form a longitudinal sample portion having a generally triangular cross-section of substantially constant area; recovering the sample portion; and



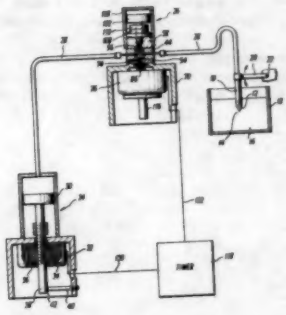
grinding at least part of the still frozen sample portion to form a generally homogeneous sample.

4,372,175

AUTOMATIC PIPETTOR EMPLOYING AN ADJUSTABLE VOLUME DELIVERY PUMP

Bernard Parker, Westport, Conn., assignor to Baker Instruments Corp., Bethlehem, Pa.

Filed Dec. 29, 1980, Ser. No. 221,152
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—864.17 **6 Claims**



1. Pipettor apparatus for dispensing accurate and precise amounts of a liquid medium which comprises, in combination:

(a) a nozzle having a tip equipped with an orifice for dispensing a liquid;

(b) a first fixed volume pump having a capacity sufficient to handle substantially all of the liquid to be dispensed;

(c) a second variable volume delivery pump having a capacity which is only a fraction of the capacity of said first pump and said second pump adapted to add or subtract liquid;

(d) said first pump being connected to the nozzle through means of a liquid passageway and said second pump being connected into the same liquid passageway in series between said first pump and said nozzle;

(e) said first and second pumps each including a two-stroke piston driven by an electrically activated device; and

(f) electrical circuit means including a timer for activating said device whereby said first pump draws a specified amount of liquid to be dispensed through said orifice and then expels this liquid through said orifice while at the same time said second pump adds or subtracts a small amount of liquid to accurately deliver the total amount of liquid desired.

4,372,176

TAPERED TOOTH HELICAL GEAR DRIVE TRAIN FOR ELIMINATING THE NEED FOR END THRUST BEARINGS

Clegia L. Terry, 2116 Curving Rd., Knoxville, Tenn. 37912

Filed Sep. 22, 1980, Ser. No. 189,183
Int. Cl.³ F16H *55/18*
U.S. Cl. 74—409 **10 Claims**

2. A gear drive combination of two gears with helically cut teeth for use with parallel drive shafts wherein axial thrust is contained by the thrust-resistive interfacing of said gears, comprising:

a first support shaft rotatably driven in a direction;

a first gear with helically cut teeth non-rotatably mounted on said first support shaft, said teeth having a constant tooth profile end to end and a uniformly tapered top land and bottom land, said tapered land occuring the length of each tooth, with the bottom land increasing in width as the top land is decreasing in width;

a second gear with helically cut teeth which spiral in the opposite direction from said first gear, the teeth of said second gear having the same constant tooth profile as said teeth of said first gear with similar but oppositely directed uniformly tapered top lands and bottom land, and which second gear teeth drivingly interface with said teeth of said first gear without backlash;

a second support shaft on which is non-rotatably mounted said second gear so that rotation of said second gear results in the rotation of said second shaft, and whereby said second gear is held in driving proximity to said first gear with a pitch diameter of one gear concurrent with the pitch diameter of the other gear along a single straight line, and with the longitudinal axis of said second shaft parallel to the longitudinal axis of said first shaft; and

wherein said top lands of said teeth of said first and second gears decrease in the direction of axial thrust produced by the driving of said second gear by said first gear.

4,372,177

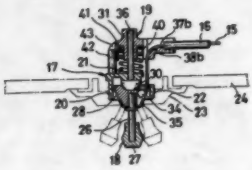
REAR-VIEW MIRROR CONTROL ACTUATOR

Toru Yamana, Fujieda, Japan, assignor to Murakami Kaimeido Co., Ltd., Japan

Continuation of Ser. No. 32,643, Apr. 23, 1979, abandoned, which is a continuation of Ser. No. 866,510, Jan. 3, 1978, abandoned, which is a continuation of Ser. No. 730,001, Oct. 6, 1976, abandoned. This application Jul. 30, 1981, Ser. No. 288,301
Claims priority, application Japan, May 19, 1976, 51-56665
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—501 M **2 Claims**

1. A remote control actuator for actuating a remotely controlled device in universal pivotal movement comprising, a casing mounted in use in a fixed position and having a fixed pivot, a control element extending into and out of said casing, a spider fixed to said control element for pivotal universal movement about said fixed pivot under the control of said control element, three flexible wires connected to said spider at three equally angularly spaced points about 120 degrees apart and having end portions connected in use to a remotely con-

trolled device to be controlled in universal pivotal movement, a guide pin fixed to said casing coaxially with said control element and said spider and extending axially away from said spider, a tensioning member for tensioning the three flexible wires jointly and continuously, said tensioning member being disposed circumferentially about said guide pin and axially slidable relative to said guide pin, said tensioning member having thereon three circumferentially spaced L-shaped, lateral projections each having a leg extending in a direction about 90° away from the axis of the guide pin defining respective channels through which respective ones of the wires extend at about 90° to the axis of the guide pin and are bent each along an L-shaped length intermediate the points of connection to the spider and lengths thereof extending outwardly of said casing, said projections underlying the bend of the bent portions and lengths thereof substantially normal to said axis and being disposed substantially aligned with respective points at the spider and axially spaced therefrom, said tensioning



member having a guide recess, a retainer pin fixed to said casing and extending substantially parallel to said guide pin into said guide recess for maintaining the tensioning element from rotating about said guide pin, a spring constantly biasing said tensioning element in a direction away from said spider element effective to cause said projections underlying the wires to continuously apply tensioning forces to the respective wires to tension said wires, the three points of connection of said wires to said spider being disposed to correspond to points each at a corresponding vertex of a respective angle of an equilateral triangle having a center coaxial with said control element and said guide pin, and said wires being connectable in use to the controlled device at points each corresponding to a respective vertex of a corresponding angle of an equilateral triangle having a center corresponding to the center of the remotely controlled device and having equilateral sides corresponding to equilateral sides of an equilateral triangle defined by said spaced points of connection of said wires to said spider and equal thereto.

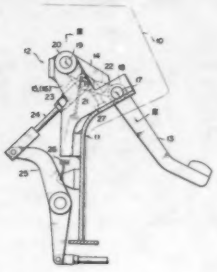
4,372,178

OPERATING FORCE TRANSMITTING APPARATUS

Shingo Ota, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,588
Int. Cl.³ G05G 1/14
U.S. Cl. 74—512 **1 Claim**

1. An operating force transmitting apparatus to be used for brake or clutch operation of a vehicle, comprising:
- a frame of the vehicle;
- a pair of brackets fixedly secured to said frame;
- first shaft means mounted on said pair of brackets astride thereto;
- first cylinder means rotatably mounted on said first shaft means, said first cylinder means having an operating member and a lever fixedly secured thereto;
- cam follower means mounted for rotation on said lever;
- second shaft means mounted on said pair of brackets astride thereto;
- second cylinder means rotatably mounted on said second shaft means;
- cam link means fixedly secured to said second cylinder means;
- spring means connected to said frame and said cam link means for urging said cam link means to always contact with said cam follower means in such a manner that the contact point of said cam link means and said cam follower means is continuously varied as said operating member is moved;



rod means fixedly secured to said second cylinder means; and

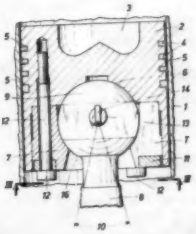
linkage means pivotally connected at one end thereof to said rod means, the other end of which is connected to a member to be controlled and operated.

4,372,179

RECIPROCATING-PISTON DRIVE MECHANISM

Anton Dolenc, and Tomas Visek, both of Vienna, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Continuation-in-part of Ser. No. 887,502, Mar. 17, 1978, abandoned. This application Jul. 18, 1979, Ser. No. 58,629
Claims priority, application Austria, Jan. 25, 1978, 519/78
Int. Cl.³ F16J 1/24
U.S. Cl. 74—579 E **2 Claims**



1. A reciprocating-piston drive mechanism comprising
(a) a reciprocating-piston assembly defining a spherical socket and including
  (1) a piston body having an axis and defining at least part of the socket, and
  (2) piston ring means carried by the piston body,
(b) a connecting rod arranged for pivoting movement in a plane and having
  (1) a ball head fitted in the spherical socket of the piston assembly, and
(c) a coupling between the ball head and the piston assembly, the coupling being arranged to transform the pivoting movement of the connecting rod and ball head into a reciprocating rotation of the piston body about the axis thereof and the coupling including
  (1) a first coupling member attached to, and non-rotatable relative to the piston body, and forming part of the piston assembly, the first coupling member consisting of

two parts defining a joint therebetween extending substantially in the plane and has an end face forming one end of the assembly, the first coupling member defining a part of the socket and having a bore adjacent the socket and extending longitudinally in the plane, the connecting rod and the bore having a common axis in the plane, and the first coupling member further having a coupling slot means extending transversely to the plane and parallel to the axis of the piston body and the coupling slot means being open to the spherical socket, and

(2) a coupling pin rotatably mounted in the ball head and extending transversely to the plane at an oblique angle to the axis of the connecting rod, the coupling pin having respective ends glidingly received in the coupling slot means,

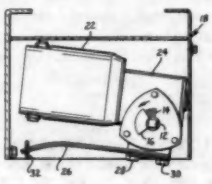
(d) the assembly including a centering ring disposed on the end face and engaging the two parts of the first coupling member for holding them together, and screws extending parallel to the axis of the piston body and securing the centering ring and the two parts to the piston body.

4,372,180

GEAR MOTOR TORQUE REACTION ABSORBER

Parker A. Bollinger, Jr., Slidell, La., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 26, 1980, Ser. No. 191,274
Int. Cl.³ F16H *57/02*; F16M *1/00*
U.S. Cl. 74—606 R **4 Claims**



1. In a gear motor mechanism including an electric motor, a gear drive assembly coupled thereto and having an output shaft, and a support structure for the gear motor and drive assembly, the improvement comprising

a first stop coupled to said output shaft to rotate therewith;

a second stop rigidly secured with respect to said support structure and disposed in the path of said first stop; and

a torque absorbing elongate leaf spring coupled between said motor and said support structure for resiliently resisting rotation of said motor in a plane perpendicular to said output shaft, said leaf spring having a first end coupled to said gear drive assembly, and a second end secured to said support structure to prevent rotation and a plane perpendicular to said output shaft, said second end being free to move longitudinally.

4,372,181

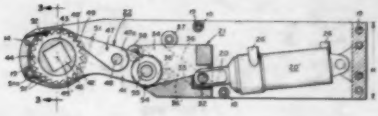
COMPACT POWER WRENCHING MACHINE

James M. Tinsley, Round Rock, Tex., assignor to N-S-W Corporation, Austin, Tex.

Filed Nov. 10, 1980, Ser. No. 205,386
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—57.39 **5 Claims**

1. In a torque wrench including an elongated rigid frame; a force-producing actuator coupled to one portion of said frame; a wrench rotatably mounted on another portion of said frame and being longitudinally spaced from said actuator; a torque applicator having a roller at one end thereof and extending longitudinally from said wrench toward said actuator; a thrust block movably mounted on said frame between said actuator and said applicator, said block having a cam surface which slopes in one direction relative to the longitudinal axis of said frame; and said roller riding on said cam surface; the improvement, wherein:

said thrust block having two parallel shoulders on the opposite sides thereof, said shoulders sloping in a direction, relative to the longitudinal axis of said frame, which is opposite to the direction of said cam surface; and



bearing means mounted on said frame to captivate said shoulders therebetween and to cause said block to gradually and simultaneously move longitudinally and transversely, when said block is acted upon by said actuator, to thereby rotate said applicator and said wrench.

4,372,182

WIRE WRAP REMOVING TOOL

Gary L. Kolter, Box 4900 New River Stage, Phoenix, Ariz. 85029

Filed Jan. 16, 1981, Ser. No. 225,685
Int. Cl.³ B25B *7/02*
U.S. Cl. 81—426 **1 Claim**

1. A tool for removing a helically wrapped wire from about a terminal pin without damaging the pin, said tool comprising in combination:

(a) a pair of jaws positionable toward and away from one another;

(b) a first jaw of said pair of jaws having a wedge shape tapering longitudinally and terminated by a flat end portion, said first jaw including a first planar working surface for contactingly engaging the wire wrap on a first side of the terminal pin;

(c) a second jaw of said pair of jaws including a second working surface having planar elements for contactingly engaging the wire wrap on a second side of the terminal pin diametrically opposed from the first side, said first and second working surfaces being oriented to effect positioning of said first and second working surfaces parallel to one another on contact with the wire wrap to apply uniformly distributed opposing forces to the wire wrap to squeeze it in one axis;

(d) a foot protruding perpendicularly from the terminal end of said second jaw toward said first jaw and extending beneath said end portion of said first jaw on closure of said pair of jaws, said foot being insertable beneath the wire wrap for lifting the wire wrap off the terminal pin on application of an upward force to said tool, said foot including a slot for receiving the terminal pin;

(e) a recess having parallel sides disposed within said second working surface and extending longitudinally along said second jaw for partially receiving the engaged side of the wire wrap, said recess being interconnected and aligned with said slot of said foot and extending therefrom along said second jaw; and

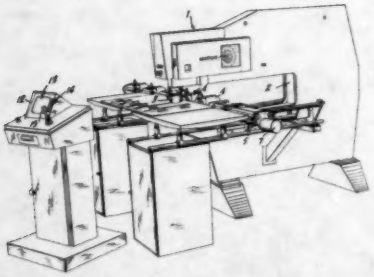
(f) means for actuating said pair of jaws to squeeze the opposed first and second sides of the wire wrap toward one another whereby the configuration of the wire wrap is distorted to reduce frictional contact of the wire wrap with the terminal pin and permit sliding disengagement of the wire wrap from the terminal pin on application of the upward force of said tool.

4,372,183

PROGRAM CONTROLLED PUNCHING AND NIBBLING MACHINE

Esko Lehtinen, Gothenburg, Sweden, assignor to Pullmax Aktiebolag, Sweden

Filed Dec. 5, 1980, Ser. No. 213,662
Claims priority, application Sweden, Dec. 7, 1979, 7910117
Int. Cl.³ B26D 7/06
U.S. Cl. 83—71 **7 Claims**



1. In a punching and nibbling machine comprising a frame, a first slide movable on said frame in a first linear direction, a second slide movable on said first slide in a second linear direction at least approximately perpendicular to said first direction, means on said second slide for holding a workpiece, and a tool reciprocable on said frame for periodic engagement with and disengagement from said workpiece,

means for moving said slides comprising a program-controlled motor for each of said slides, a linear transmission element driven by each of said motors respectively and movable in the direction of movement of the respective slide, and resilient means coupling each of said slides individually with the respective transmission element for movement of said transmission element by said motor while the respective slide is held stationary by engagement of said tool with said workpiece, said slide being moved to predetermined position by force stored in said resilient coupling means upon disengagement of said tool from said workpiece.

4,372,184

CUTTING ASSEMBLY

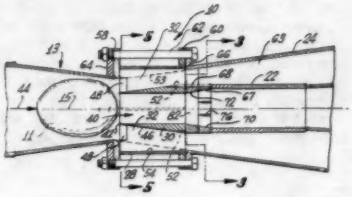
Wayland I. Fisher, Boise, and Marvin J. Petersen, Homedale, both of Id., assignors to J. R. Simplot Company, Boise, Id.

Filed Feb. 25, 1981, Ser. No. 238,007
Int. Cl.³ B26D 1/03
U.S. Cl. 83—98 **22 Claims**

13. For use in a system including an hydraulic pressure conduit, means for propelling a product one at a time through said pressure conduit along with a propelling hydraulic fluid, an inner discharge conduit, and an outer discharge conduit positioned generally concentrically about the inner discharge conduit, a cutting assembly for dividing the product into a generally cylindrical central core for discharge to said inner conduit and a plurality of longitudinally extending outer strips each having a generally arcuate cross section for discharge to said outer conduit, comprising:

an exterior housing connected between said pressure conduit and said outer conduit and having a central longitudinal passage formed therein;

a generally cylindrical hollow core knife mounted on said inner conduit and projecting axially toward said pressure conduit within said housing passage, said core knife having a generally circular cutting edge formed at its axial end opposite said inner conduit; and



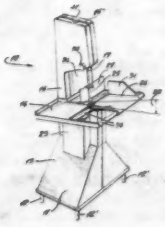
a plurality of strip knives each extending radially between said core knife and said housing, each of said strip knives including a cutting edge presented generally in the same direction as said core knife cutting edge, said core knife and said strip knives being operable to divide the product into the core for passage through said core knife into said inner conduit and said outer strips for passage between said core knife and said housing for passage into said outer conduit.

4,372,185

MEAT CUTTING BAND BLADE MACHINE

Karl Pila, 5605 Greenwood Ave., Cote St. Luc, Quebec, Canada

Filed Feb. 23, 1981, Ser. No. 237,268
Int. Cl.³ B23D 53/06
U.S. Cl. 83—101 **9 Claims**



1. A meat cutting machine for slice cutting soft boneless meats, said machine comprising a base, a vertical band blade support frame secured to said base, blade support means secured in said band blade support frame, a flat band blade supported by said support means, drive means drivingly connected to said blade support means, an opening in said band blade support frame to expose a meat cutting area along a straight path of said band blade, a stationary table secured below said meat cutting area, a horizontally displaceable meat support table displaceable on an axis parallel to the plane of said flat band blade to displace an end portion of a piece of meat placed on a support surface thereof against a cutting edge of said band blade; said horizontally displaceable meat support table having its support surface inclined rearwardly downward at an angle lying within the range of from 5° to 15° with said

band blade extending at substantially a right angle with respect to said support surface of said displaceable meat support table, said blade support means being a pair of band support wheels rotatably secured in a spaced apart manner by said support frame, said band blade being an endless blade having a straight cutting edge and supported about said wheels, said stationary table and said displaceable meat support table being secured to said band blade support frame and have their support surface inclined in the same plane, said wheels having their centers rotatably secured on an axis inclined rearwardly at the same angle as said surfaces, said support surfaces being disposed at right angles to said straight path of said band blade, and a thickness gauge plate displaceably secured above said stationary table and extending parallel to the plane of said blade, means to displace said gauge plate to a predetermined distance from said meat cutting area of said blade to obtain a desired slice thickness of said piece of meat placed on said displaceable meat support table.

4,372,186

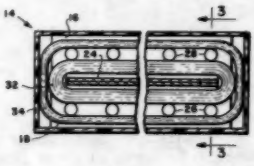
HUMBUCKING ELECTROMAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

Kenneth T. Aaroe, 2276 John Ct., Castro Valley, Calif. 94546

Filed Feb. 17, 1981, Ser. No. 235,004

Int. Cl.³ G10H *3/18*

U.S. Cl. 84—1.15 **15 Claims**



1. A humbucking electromagnetic pickup for musical instruments having ferromagnetic strings, said pickup comprising:

magnetic means for generating a magnetic flux path through the ferromagnetic strings of a musical instrument;

a sensing coil positioned in said flux path for generating output signals corresponding to flux variations produced by vibration of said strings; and

a humbucking coil in series with said sensing coil but wound in an opposite direction thereto, said humbucking coil being concentric with said sensing coil and having a greater inside dimension than the outside dimension of said sensing coil.

4,372,187

NOVEL GUITAR-LIKE ELECTRONIC MUSICAL INSTRUMENT

Arne L. Berg, La Puente, Calif., assignor to AB Laboratories, a limited partnership, Van Nuys, Calif.

Filed May 1, 1981, Ser. No. 259,519

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **4 Claims**

1. A guitar-like electronic musical instrument including: an electronic tone generating circuit and control means for controlling said tone generating circuit, said control means including an intentionally damped vibratory element;

said control means including, in addition, a neck control element;

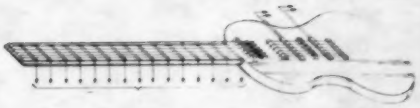
a potentiometer mechanically coupled to said neck control element and having a slider arm responsive to transverse displacement of said neck control element to change its position, and having a slider-arm terminal at which a variable voltage appears in response to the change in position of said slider arm;

an electronic gate having an input terminal coupled electrically to said slider-arm terminal and having an output terminal and a control terminal;

a touch sensing circuit coupled electrically to said neck control element and responsive to the touching of such element to produce an output signal;

means for coupling said output signal from said touch sensing circuit to said control terminal of said electronic gate;

said gate being responsive to said output signal from said touch sensing circuit to produce a closed condition,



whereby said voltage at said slider-arm terminal appears at the output of said gate;

a first amplifier having a first non-inverting input terminal and a first output terminal;

a second amplifier having a second non-inverting input terminal and a second output terminal;

said first non-inverting terminal being electrically coupled to said slider arm terminal;

said second non-inverting terminal being connected to said output terminal of said electronic gate;

a storage capacitor coupled between said second non-inverting input terminal and reference potential;

a differential amplifier having first signal and second signal input terminals and a difference signal output terminal;

said first output terminal of said first amplifier being connected to said first signal input terminal;

said second output terminal of said second amplifier being coupled to said second signal input terminal;

and means for coupling said difference signal output terminal to said tone generating circuit.

4,372,188

Patent Not Issued For This Number

4,372,189

AMPLIFICATION ARRANGEMENT FOR VIOLIN SOUND BARS

Charles S. Johnson, 5208 12th St., So., Arlington, Va. 22204

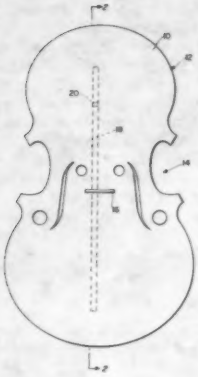
Filed Feb. 11, 1982, Ser. No. 347,980

Int. Cl.³ G10D *3/02*

U.S. Cl. 84—276 **3 Claims**

1. In a violin or like instrument including a hollow body, a bridge located on the hollow body and a wooden sound bar

located within the hollow body under the left foot of the bridge, the improvement comprising a sound enhancing metallic weight member inserted into the sound bar at a location



approximately one half of the distance between the bridge and the upper end of the hollow body of the violin, and of a weight of less than about one gram.

4,372,190

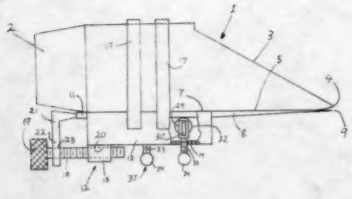
SAXOPHONE MOUTHPIECE HAVING REED ADJUSTMENT MEANS

Jay S. McGuerty, 115 Beckham Way, Cincinnati, Ohio 45246

Continuation-in-part of Ser. No. 202,684, Oct. 31, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,846

Int. Cl.³ G10D *9/02*

U.S. Cl. 84—383 R **26 Claims**



1. In a woodwind musical instrument mouthpiece of the type including a hollow member having a mouth engaging end terminating in a generally arcuate edge and a lower face extending forwardly of said edge configured to mount an elongated reed having a front tip position adjacent said arcuate edge and a rear edge surface spaced rearwardly from said tip and extending downwardly from said lower face, the improvement in combination therewith comprising means for urging said reed against the mouthpiece face comprising a rotatably mounted cylindrical roller and positioned and configured to bear against the outer surface of the reed and means for accurately adjusting the longitudinal position of said reed on the mouthpiece to place the reed tip at a desired location with respect to said arcuate edge.

4,372,191

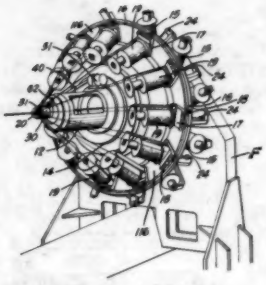
ROTARY BRAIDING MACHINE

Vincent A. Iannucci, West Lawn, and Rudolf H. Haehnel, Reading, both of Pa., assignors to Rockwell International Corp., Pittsburgh, Pa.

Filed Mar. 12, 1982, Ser. No. 357,395

Int. Cl.³ D04C *3/42*

U.S. Cl. 87—48 **14 Claims**



1. In a rotary braiding machine having power means for rotating the machine and for drawing the strand from supply bobbins toward a point of convergence where interlacing and braiding takes place;

a. an outer set of bobbins carrying strands;

b. means mounting said outer set of bobbins for travel in one direction along a circular path concentric with the center axis of the machine;

c. an inner set of bobbins carrying strands;

d. means mounting said inner set of bobbins for travel along a circular path in a direction opposite to that of said outer set of bobbins;

e. outer strand guide means for guiding the strand from the outer set of bobbins over and under the bobbins of the inner set during rotation of the machine, thereby to cause interlacing between the strands of the inner and outer sets of bobbins as they travel in opposite directions;

f. a cylindrical guide member on the center axis of the machine projecting forwardly from the bobbin-mounting means toward the point of strand convergence, said strands being drawn over the forward edge of said cylindrical guide member as said strands move toward said point of convergence and interlacing;

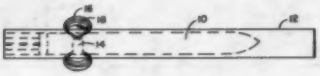
g. a sleeve member mounted concentricily on said cylindrical guide member; and

h. means for providing relative reciprocating motion in the axial direction between said sleeve member and said guide member, whereby the forward edge of one of said members engages said strand when said one member is in its forward position eliminating strand contact with said other member but disengages from said strand when said one member is in its rearward position allowing strands to again contact said other member.

4,372,192
FIRST MOTION DETECTOR

Jeffrey A. Lienau, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1980, Ser. No. 219,046
Int. Cl.³ F41F 25/00; F41C 27/00
U.S. Cl. 89—1.8 3 Claims

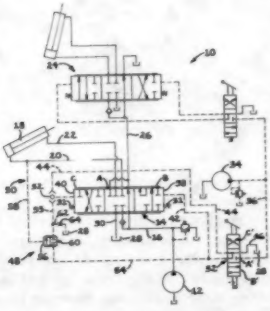


1. A first motion detector device comprising a rocket mounted to launching means, said rocket having magnetic means thereon that produces a magnetic field, detector means mounted to said launching means for said rocket and being positioned in a forward portion of said magnetic field, said detector means being made of such a material and having electronics connected thereto to produce an output which indicates actual movement of said rocket relative to said launching means as said rocket moves from said launching means.

4,372,193
SYSTEM WITH CONSTANT FORCE ACTUATOR

Lowell R. Hall, Elmwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01741, § 371 Date Dec. 24, 1980, § 102(e) Date Dec. 24, 1980, PCT Pub. No. WO82/02230, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 24, 1980, Ser. No. 273,877
Int. Cl.³ F15B 11/10
U.S. Cl. 91—420 7 Claims



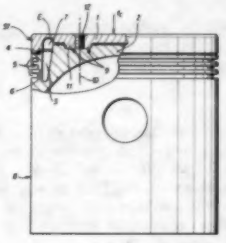
1. In a fluid system (10) having a fluid source (12), a tank (28); an actuator (18); a pilot operated control valve (14) having first and second ends (38,40) and movable between an actuated position (B) at which said source (12) communicates with said actuator (18) and is blocked from a downstream control valve (24), and a neutral position (A) at which fluid from said source (12) is blocked from communication with said actuator (18) and communicates with said downstream control valve (24) through said pilot operated control valve (14); a source (34) of pressurized pilot fluid; and a pilot control valve (32) connected to said source (34) of pressurized pilot fluid and said first and second ends (38,40) and movable between a neutral position (A') at which said source (34) of pressurized pilot fluid is blocked from communication with said first and second ends (38,40), and an actuated position (B') at which pressurized pilot fluid from said source (34) is communicated with the first end (38) establishing a differential pressure between the first and second ends (38,40); the improvement comprising:

means (48) for modulatably reducing the pilot differential pressure between the first and second ends (38,40) of the pilot operated control valve (14) only at the actuated position (B) of the pilot operated control valve (14) in response to the fluid pressure in said actuator (18) reaching a predetermined level while said pilot control valve (32) is still in said actuated position (B^1), so that said pilot operated control valve (14) is controllably moved between the neutral and actuated positions (A, B) to maintain said predetermined pressure level in said actuator (18) and to pass working fluid to the downstream control valve (24) and subsequently to said tank (28).

4,372,194
INTERNAL COMBUSTION ENGINE PISTON

Jean P. Vallaude, Orsay, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

PCT No. PCT/FR79/00029, § 371 Date Nov. 30, 1979, § 102(e) Date Nov. 30, 1979, PCT Pub. No. WO79/00862, PCT Pub. Date Nov. 1, 1979
PCT Filed Mar. 30, 1979, Ser. No. 177,769
Claims priority, application France, Mar. 31, 1978, 78 09460
Int. Cl.³ F01P 1/04; F02F 3/16
U.S. Cl. 92—176 3 Claims



1. A piston for an internal combustion engine, comprising:

a circular steel upper head element having an upper surface defining the entire piston face and a lower surface which are axially spaced to form a first thickness;

a circular light alloy lower skirt element having a radially outer surface, an upper surface covered by said lower surface of said upper element, said lower element including at least one first circumferential groove on the peripheral surface thereof;

means for securing said upper and lower elements to one another;

an annular U-shaped cavity defined in said upper surface of said lower element adjacent said peripheral surface, said cavity extending axially at least to a position closely adjacent said at least one first circumferential groove;

an annular U-shaped second groove defined in said lower surface of said upper element and facing said cavity to form a dead space, said second groove extending axially towards said upper surface of said upper element by a distance sufficient that the upper extremity of said second groove is separated from said upper surface of said upper element by less than said first thickness,

wherein only said lower element includes at least one of said first grooves and wherein said upper and lower elements are centered only by contacting circumferential surfaces adjacent the peripheries of said upper and lower elements, said contacting circumferential surfaces acting to seal said dead space, further including:

at least one boss extending from said lower surface of said upper element in an area radially inward from said second groove;

at least one second cavity on said upper surface of said lower

element, each said second cavity corresponding to one said at least one boss;

radially extending contact surfaces between said upper and lower elements, said radially extending contact surfaces consisting only of said at least one boss and corresponding cavity; and

a threaded hole in said upper element at each said at least one boss, wherein said means for securing is engaged between at least one said second cavity and threaded hole.

4,372,195

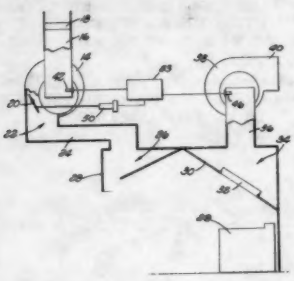
MASS FLOW THERMAL COMPENSATOR

John Dorius, 8601 International Ave., Unit 203, Canoga Park, Calif. 91304

Filed Nov. 17, 1980, Ser. No. 207,164

Int. Cl.³ F24C *15/20*

U.S. Cl. 98—115 R **12 Claims**



1. In an apparatus for balancing inlet air flow against exhaust air flow in a system for exhausting air from a work space, the apparatus containing an inlet fan including a spoiler, in fluid communication with a source of fresh air and discharging into the workspace to define an inlet air passage, and an exhaust fan in fluid communication with the workspace and discharging externally of the workspace to define an exhaust air passage, the improvement comprising:

an inlet air temperature sensor in the inlet air passage; and

control means for controlling the weight rate of air through the inlet fan in response to the temperature sensed by the inlet air temperature sensor, comprising means for regulating the position of the spoiler to maintain a selected relationship between the weight rate of inlet air and an actual or assumed weight rate value of exhausted air.

4,372,196

INSULATING AND DRAFT PREVENTING AUTOMATIC SHUTTER FOR ATTIC AND OTHER EXHAUST TYPE FANS

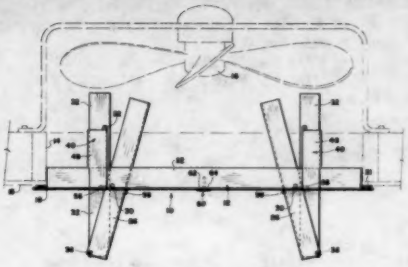
Donald L. Henderson, 2536 E. 56th Pl., Tulsa, Okla. 74105

Filed Mar. 30, 1981, Ser. No. 249,169

Int. Cl.³ F24F *7/06*

U.S. Cl. 98—116 **7 Claims**

1. An insulating and draft preventing automatic shutter for the air intake opening of an exhaust fan and comprising a horizontally positioned mounting frame means adapted for installation in the opening, insulating louver assembly means pivotally disposed within the mounting frame and automatically movable by the flow of air between open and closed positions in response to activation and deactivation of the fan the louver assembly means comprising oppositely disposed channel members pivotally secured, at a point between the ends of the channel members, to the mounting frame; an inner frame means composed of an insulating panel member, positioned within the channel members and pivotally secured thereto at the proximity of one end of both the channel members and the inner frame means which will be upstream of the flow of air through the mounting frame when in the open position; and means during the open position to preclude pivotation of the channel members to a position substantially transverse to the mounting frame, yet permit pivotation of the inner frame to a position substantially parallel to the flow of air through the mounting frame.



4,372,197

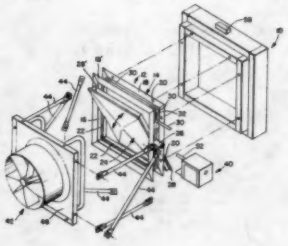
COLD WEATHER INLET FOR VENTILATING SYSTEMS

Norman D. Augsburger, Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corporation, Muskogee, Okla.

Filed Nov. 14, 1980, Ser. No. 206,839

Int. Cl.³ F24F *13/18*; F16K *49/00*

U.S. Cl. 98—118 **5 Claims**



1. An inlet for use in a ventilating system to permit air to enter a building, comprising:

a frame to be positioned within a wall of the building to define an opening through which air may enter the building, said frame having four wall sections provided with:

flanges extending outwardly therefrom, and lips along the mid portions thereof extending inwardly therefrom into the opening defined by the frame;

a single panel, a shaft journaled for rotation within two of said wall sections and attached to said single panel at the mid portion thereof permitting said panel to rotate within said frame to open and close the opening, said panel including:

a first flange extending outwardly from one side thereof above said shaft, and

a second flange extending outwardly from the other side of said panel below said shaft, such that when said panel is in closed position a tight seal exists along the periphery of said single panel at the juncture of said lips which extend inwardly from said four wall sections and said first and second flanges which extend outwardly from opposite sides of said single panel;

an electrical heating cable, means positioning said cable along the periphery of said four wall sections of said frame between said flanges which extend outwardly from said

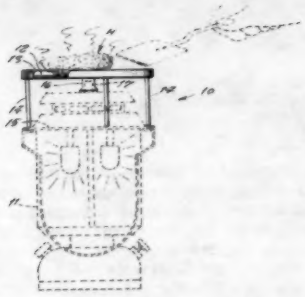
frame such that said cable extends laterally along said frame in close proximity to said lips and said first and second flanges of said panel enabling heating thereof; and means for rotating said single panel and energizing said electrical heating cable.

4,372,198

LANTERN HOT PLATE

Henry D. Stover, Jr., c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Apr. 13, 1981, Ser. No. 253,618
Int. Cl.³ A47J 37/00
U.S. Cl. 99—340 2 Claims



1. A lantern hot plate, comprising in combination, a circular metal plate, an upward peripheral lip forward on said metal plate, a lantern and means for securement of said metal plate upon a top of said lantern, wherein said hot plate includes oven means for converting said hot plate into an adjustable oven, wherein means under center of said metal plate prevent sideward shift of said hot plate upon said lantern, wherein said oven means comprises a cylindrical member having vertically spaced tabs adapted to engage said plate at various levels whereby said member encircles said plate and extends thereabove at various levels.

4,372,199

ROTARY SKEWER COOKER

Leo F. Brown, and R. S. Myerly, both of Chillicothe, Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Feb. 12, 1981, Ser. No. 233,775
Int. Cl.³ A47J 37/04
U.S. Cl. 99—341 6 Claims

1. A rotary skewer cooker comprising

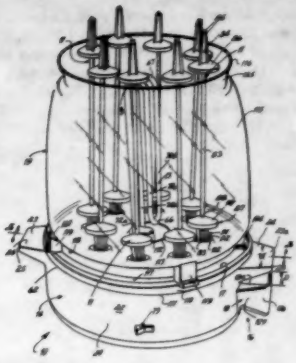
a plurality of skewers, said skewers being generally vertically oriented,

a skewer drive mechanism at least partially mounted in a housing, said skewer drive mechanism being selectively innerconnectable with each of said skewers for rotating each of said skewers relative to that skewer's axis,

a heat source connected to said housing, said heat source being adapted to cook food on said skewers,

a generally tubular chimney seated on said housing, said chimney extending upwardly from said housing so as to enclose food products carried on said skewers, said chimney being open at the top end thereof for permitting manual accessability to one end of each skewer during use of said cooker, said accessability allowing installation and removal of said skewers with said skewer drive mechanism in generally vertical fashion within said chimney relative to said housing during use of said cooker, and

chimney seat structure partially carried by said chimney and partially carried by said housing, said seat structure being constructed so that an air gap is established between said housing and the bottom edge of said chimney when said chimney is in operative assembly with said housing, said



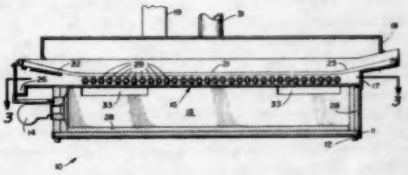
air gap permitting air flow up through said chimney during use of said cooker.

4,372,200

DIRECT FIRED FRYER WITH WIPER MEANS

Andrew A. Caridis, Foster City; Clark K. Benson, Millbrae, and Anthony A. Caridis, Belmont, all of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

Filed May 4, 1981, Ser. No. 260,101
Int. Cl.³ A47J 37/12
U.S. Cl. 99—404 9 Claims



1. An improved, direct fired fryer for cooking foodstuffs, comprising a frame, means on said frame defining a combustion chamber, burner means serving to heat the atmosphere within said combustion chamber, means providing a cooking vat on said frame serving to hold a supply of cooking oil or the like and including a generally planar bottom wall serving as a heat transmitting member between said combustion chamber and the cooking oil within said vat, first, second and third manifold means on said frame, said first manifold means being in communication with said combustion chamber, said first and second manifold means including a first set of heat conducting tubes extending therebetween, said second and third manifold means including a second set of heat conducting tubes extending therebetween, said sets of heat conducting tubes serving to transfer heat from the combustion chamber to the cooking oil and being disposed in said cooking vat below the nominal oil liquid level therein and above said bottom wall, means on said fryer providing an exhaust stack in communication with said third manifold means, said combustion chamber, manifold means, conducting tubes and exhaust stack communicating in a circuit so that the heated atmosphere from said combustion chamber traverses sequentially said first manifold means and first set of heat conducting tubes, said second manifold means and said second set of heat conducting tubes and thence through said third manifold means and the exhaust stack.

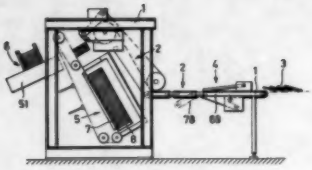
4,372,201
DEVICE FOR PRODUCING A BUNDLE OF PAPER SHEETS

Ernst Dudziak, Harsewinkel; Gerd-Georg Kwauka, Gutersloh; Arthur Plate, Lubbecke, and Hermann Lübeck, Espelkamp-Frotheim, all of Fed. Rep. of Germany, assignors to Reinhard Mohn G.m.b.H., Gutersloh, Fed. Rep. of Germany

Division of Ser. No. 963,125, Nov. 22, 1978, Pat. No. 4,311,090. This application Jun. 29, 1981, Ser. No. 278,376

Int. Cl.³ B65B *13/02*

U.S. Cl. 100—7 **45 Claims**



1. A device for producing a bundle from an overlapping sheet by sheet stream of paper sheets according to a method wherein the sheets are serially free fall delivered to a downwardly moving inclined base while the sheets are continuously jogged and pressed as the stack is being formed, the serial free fall delivery of the sheets being interrupted after a predetermined number of delivered sheets and the compressing being effected by moving a compressor downwardly against the top of the stack at a rate faster than the stack is moving and the compressed stack is banded to form the bundle, said device comprising: a machine frame, a stacking table within said frame, said stacking table having means defining an inclined back wall for supporting the stack and base plate means arranged vertically relative to the plane of said defined back wall for receiving the free-fall delivered sheets, feed means carried by said machine frame for free-fall delivering a sheet by sheet stream to said stacking table, circulating conveying means carried by said machine frame, said base plate means carried on said circulating conveying means, means for pressing the formed stack also carried by said circulating conveying means, and means for separating the formed stacks one from the next following stack, said inclined back wall including stop face means for receiving the sheets in abutting relationship therewith at the terminus of their free fall; said circulating conveyor means comprising first and second circulating conveyors, said first circulating conveyor carrying said base plate means, and said pressing means comprising follow-up transporter plate means carried by said second circulating conveyor along a common path as the base plate means and substantially parallel thereto and drive means for moving said second circulating conveyor faster than said first circulating conveyor to bring the follow-up transporter plate means against the top of the stack carried by the base plate means during the movement of the base plate means.

4,372,202
EMERGENCY BRAKE FOR PRESSES

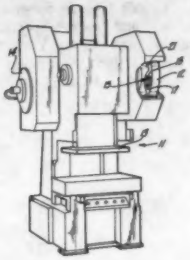
Russell J. Cameron, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed Nov. 20, 1980, Ser. No. 208,546

Int. Cl.³ B30B *15/10*

U.S. Cl. 100—53 **6 Claims**

1. An emergency brake for a press or the like having a ram and driving element operatively connected to said ram for operating said ram through a cycle of operation from a home position to a working position and back to a home position, said emergency brake comprising a first brake element fixed for rotation upon operation of said driving element, said first brake element having a braking surface extending outwardly from a surface thereof, a second brake element fixed against rotation relative to said first brake element, said second brake element having a braking surface complimentary to the braking surface of said first brake element, and means for actuating said second brake element from a released position wherein said braking surfaces will not interfere with each other upon relative rotation of said brake elements upon the initiation of a cycle of the press or the like and a braking position wherein said braking surfaces may engage each other to prevent further rotation of said first brake element after a predetermined move-



ment of said first brake element less than that required for it to reach when the driving element is in its working position, said braking surfaces of said first and second brake elements being spaced from each other when said ram is in its home position and said second brake element is in its braking position, the spacing of said surfaces when in such positions being such that said surfaces will engage upon movement of said ram in a small increment beyond its home position towards its working position.

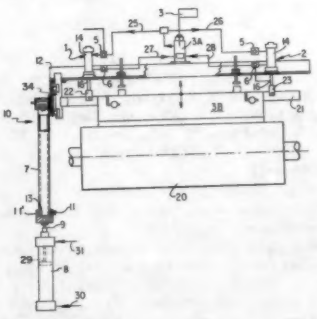
4,372,203
DOCTOR-BLADE SUPPORT MEANS FOR SILK SCREEN PRINTING MACHINE

Umberto Brasa, Via Ippolite Nievo No. 8, Milan, Italy

Filed Jul. 30, 1979, Ser. No. 61,659

Int. Cl.³ B41L *13/18*

U.S. Cl. 101—124 **8 Claims**



1. For use in a silk screen printing machine of the type including an impression cylinder and a doctor-blade arrangement mounted parallel to the surface of the impression cylinder and support means carrying said doctor-blade and having opposite ends; a pair of vertically arranged, reciprocably movable bearing columns having their upper ends coupled to said support ends and their lower ends coupled to a pair of fluid pressure operated piston and cylinder devices, each piston having a plunger extending outward of the cylinder coaxial with with one of said bearing columns and coupling means linking each column with each plunger, respectively, said coupling means comprising a ring mounted upon each column

and having a bore capable of receiving said plunger therein, said columns being coaxial with the respective pistons of said piston and cylinder devices, control valve means for controlling the flow of pressurized fluid from a source thereof to said fluid pressure operated piston and cylinder devices to raise and lower the bearing columns for moving the doctor-blade relative to the impression cylinder.

4,372,204

LITHOGRAPHIC SHEET FED PRESS HAVING MEANS FOR CLEARING A JAMMING CONDITION

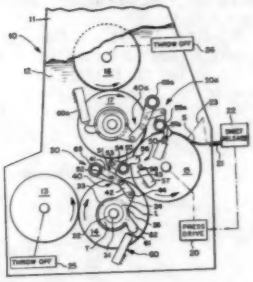
Georg Herzan, Bad Soden, and Claus Simeth, Offenbach am Main; Herbert Rebel, Rodgau, all of Fed. Rep. of Germany, assignors to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,625

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944272

Int. Cl.³ B41F *13/28, 13/40*

U.S. Cl. 101—145 9 Claims



1. A lithographic sheet fed press having means for clearing a jamming condition comprising, in combination, a pair of frame plates, a plate cylinder, blanket cylinder and an impression cylinder all having stub shafts journaled in the respective frame plates and arranged serially for rolling engagement of the cylinders with one another, means for feeding sheets to the impression cylinder, eccentric bushings interposed between the stub shafts of the blanket cylinder and the frame plates, the eccentric bushings having respective operating arms, toggle linkages respectively interposed between the arms and the associated frame plate and settable in a slightly overcenter operating condition for maintaining normal printing pressure between the blanket cylinder and the impression cylinder, means for relieving pressure between the blanket and impression cylinders upon the occurrence of a jamming condition in which a plurality of sheets become wedged between such cylinders, said pressure relieving means including (a) a toggle-breaking first power actuator laterally coupled to the toggle linkages for breaking the same to the opposite side of dead center, (b) a back-off second power actuator coupled to the bushings for imparting substantial rotation to the bushings accompanied by relief of pressure and full collapse of the toggle linkages with scissoring action, (c) means for sequentially energizing the first and second power actuators, and means for subsequently resetting the toggle linkages to the overcenter operating condition following removal of the wedged sheets.

4,372,205

APPARATUS FOR BENDING A PRESSURE ROLL OF A ROTARY PRINTING PRESS

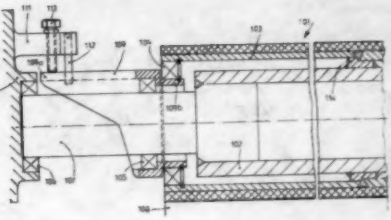
August Pflaum, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,466

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940878; Feb. 15, 1980, 3005690

Int. Cl.³ B41F *9/06, 13/26*

U.S. Cl. 101—153 4 Claims



1. Apparatus for bending a pressure roll of a rotary printing press which is composed of an axle and a cylindrical shell mounted on the axle and maintained parallel to a counter-cylinder or counter-roll, said apparatus including the improvement wherein:

said axle is a rotary axle on which said shell is fixed by at least one connection piece (**14**) of a configuration permitting transmission of bending moments exerted on said shell;

a pivoted lever (**109**), swingable in the bending plane of the pressure roll (**101**) and at least partly tubular, is provided which has a tubular portion surrounding at least the inner portion of the adjacent axle stub end (**107**) and supported and bearing on said axle end by means of a first swing bearing (**105**) between an end of the pressure roll and a sidewall member (**110**) in which said axle is supported by a bearing, said lever having a first lever arm (**109***a*) for application thereto of a force generating an angular moment about the pivot of the lever and a tubular second lever arm (**109***a*) having a second swing bearing for exerting a bending moment on said shell (**103**) through said second swing bearing (**104**), and

means are provided for applying said force to said first lever arm (**109***a*) in order to cause said second lever arm (**109***b*) to exert bending moment on said shell, said force applying means including means (**112**) for circumferentially fixing said lever.

4,372,206

DEVICE FOR CONTROLLING THE MOVEMENT OF A WEB THROUGH A PRINTING MACHINE

Eric Tison, Perthes, and Paul Herve, Viry-Chatillon, both of France, assignors to Codimag, Perthes and Ets. Destouche, S. Orge, both of, France

PCT No. PCT/FR80/00060, § 371 Date Dec. 9, 1980, § 102(e) Date Dec. 9, 1980, PCT Pub. No. WO80/02258, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 18, 1980, Ser. No. 224,541

Claims priority, application France, Apr. 18, 1979, 79 09719

Int. Cl.³ B41F *13/54*

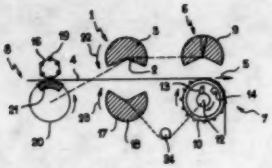
U.S. Cl. 101—228 7 Claims

1. A printing machine comprising:

a rotary printing cylinder having a printing speed for printing a web, with the possibility of changing the format, said machine operating in successive printing cycles and each cycle being defined as one rotation of the printing cylinder

and involving the printing of one area of the web in the said format;

a first endless traction device and another endless traction device both located downstream of the printing cylinder for engaging and conveying the web independently of one another after it has travelled past the printing cylinder, said first endless traction device conveying the web forwards at a take-up speed which is at most equal to the printing speed and comprising a freely rotating web engaging sprocket device having a stop and a rotor which is continuously driven at the take-up speed, said rotor having a stop which drives the sprocket device by the contact



of its stop with the stop of the sprocket device whereby said sprocket device is free to intermittently rotate at a higher speed than the take-up speed but constrained to rotate at the take-up speed when its stop contacts the rotor stop, and said another endless traction device comprising a rotary member for intermittently conveying the web at the printing speed, in synchronisation with printing contact between said printing cylinder and the web; and

a device upstream of the printing cylinder for pulling the web backwards in order to re-absorb, during each printing cycle, any excess web length resulting from a difference between conveying at the printing speed and conveying at the take-up speed.

4,372,207

INK FOUNTAIN DEVICES FOR USE IN PRINTING PRESS

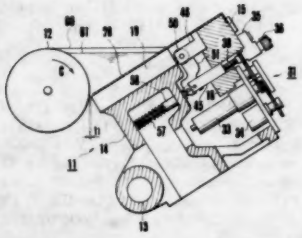
Hideaki Toyoda, Tokyo, Japan, assignor to Komori Printing Machinery Co., Ltd., Japan

Filed Oct. 2, 1981, Ser. No. 307,854

Claims priority, application Japan, Mar. 10, 1981, 56-34304; Mar. 10, 1981, 56-34305

Int. Cl.³ B41F *31/04, 31/06*

U.S. Cl. 101—365 **6 Claims**



1. An ink fountain device for use in a printing press comprising:

an ink fountain roller dipped in an ink pot;

a blade support;

a plurality of divided blades juxtaposed on said blade support to be movable toward and away from a periphery of said ink fountain roller;

first spring means for urging said divided blades to move away from said ink fountain roller towards a plurality of brackets secured to said blade support;

a plurality of adjusting levers respectively pivotably mounted on said brackets;

a plurality of rollers supported by said brackets with their peripheries engaged with rear ends of respective divided blades;

a plurality of sliding members supported by said blade support to reciprocate in the same directions as said divided blades and respectively provided with screw threads;

means for operatively connecting said adjusting levers with respective sliding members;

a plurality of a adjusting screws respectively mating with said screw threaded of said sliding members; and

second spring means for urging said sliding members to cause to swing said adjusting levers so as to cause said rollers to move said divided blades toward said ink fountain roller.

4,372,208

DEVICE FOR SUPPLYING WITH INK PRINTING APPARATUS FOR CIGARETTE-MAKING MACHINES

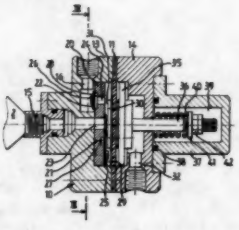
Andre Legardinier, Plessis-Bouchard, France, assignor to Decoufle S.A.R.L., Paris, France

Filed Apr. 1, 1981, Ser. No. 249,913

Claims priority, application France, Apr. 1, 1980, 80 07314

Int. Cl.³ B41F *31/08*

U.S. Cl. 101—366 **3 Claims**

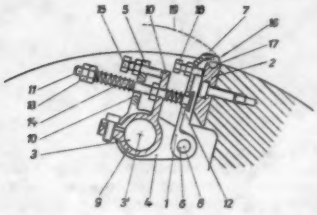


1. An inking device for a printer of a cigarette making machine comprising a diaphragm pump including a pair of casing members having a membrane secured therebetween, one of said casing members having an inlet bore and an outlet bore, an ink containing tube secured in said inlet bore, a flexible conduit having one end secured to said outlet bore and the other end to said printer, a plate positioned in said one of said casing members in spaced parallel relation to said membrane and defining therewith a chamber, said plate having a first orifice therein communicating with said inlet bore and said chamber and a second orifice communicating with said chamber and said outlet bore, valve members secured to opposite faces of said plate for controlling said orifices and the flow of ink to and from said chamber with respect to said bores, said second casing member having a piston and piston rod therein, said piston secured to said membrane, said inlet bore and said first orifice and said piston rod being positioned on a common axis with the axis of said outlet bore being disposed in a plane normal to said common axis, a bore in said second casing member connected to a source of compressed air for moving said piston and membrane towards said plate and a return spring connected to said piston rod.

4,372,209
SHEET GRIPPING JAR ARRANGEMENT

Arndt Jentzsch, Coswig; Hans Johne, Radebeul; Victor Hefftler, Coswig; Werner Kühnert, Radebeul, and Reiner Karl, Coswig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Filed Oct. 14, 1981, Ser. No. 311,294
Claims priority, application German Democratic Rep., Nov. 17, 1980, 225240
Int. Cl.³ B41F 21/04
U.S. Cl. 101—409 9 Claims

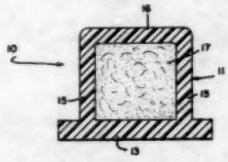


1. A sheet gripping arrangement of a rotary printing machine, comprising a sheet gripper abutment member; a soft gripper seat member; a gripper shaft having a gripper shaft pivot point; a sheet gripping element including a gripper finger cooperating with said gripper seat member and eccentrically pivotable relative to said gripper shaft about a gripper finger pivot point so as to move first over a substantially flat gripping path and then to move during its final movement phase normally to the latter; and a threaded abutment member arranged in said finger member and acting against said sheet gripper abutment member to have a contact point with the latter, said gripper finger being arranged at an angle of substantially 90° to said contact point of said threaded abutment member, said gripper finger pivot point, and said gripper shaft pivot point.

4,372,210
PYROTECHNIC CAP WITH MECHANICALLY DESENSITIZED COMPOSITION

John W. Shaffer, and Thomas L. Gavenonis, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 10, 1979, Ser. No. 2,264
Int. Cl.³ C06C 7/00
U.S. Cl. 102—204 4 Claims

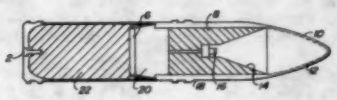


1. In a pyrotechnic cap for providing an audible signal of high intensity upon receipt of energy in the form of light and/or heat from a flashlamp wherein said cap includes a plastic container having a pyrotechnic composition hermetically sealed therein separately from said flashlamp, the improvement wherein said pyrotechnic composition comprises a powdered mixture of a quantity of pyrotechnic material and a predetermined quantity of a low density, nontoxic desensitizing material having soft, readily distortable particles, the size of said particles being equal to or less than the size of the particles of said pyrotechnic material, said desensitizing material desensitizing said pyrotechnic cap against ignition by application of mechanical force thereto and not against ignition by said light and/or heat from said flashlamp.

4,372,211
THERMOELECTRIC POWER SUPPLY FOR WARHEADS

James G. Dante, Churchville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1980, Ser. No. 140,029
Int. Cl.³ F42C 11/00; H01L 35/14
U.S. Cl. 102—207 10 Claims



1. In a round assembly having a propellant, an igniter for activating said propellant, explosive material, and a detonator for activating said explosive material, a fuze comprising:

(a) an impact sensor for sensing impact of said round assembly, which includes;

a triboluminescent material coated on the inside surface of an ogive contained within said round assembly;

(b) a thermoelectric power supply comprising a plurality of junction means coupled to said propellant for sensing said propellant temperature, and voltage generating means in response to temperature sensed by said junction means, including;

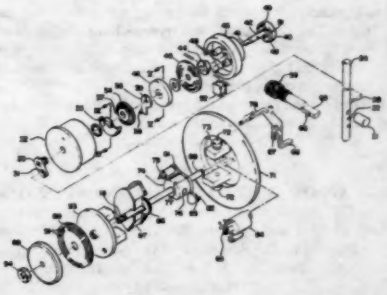
storage means for storing said voltage generated by said thermoelectric power supply, and

(c) means responsive to said impact sensor and communicating with said detonator so as to cause the detonator to activate and detonate the explosive.

4,372,212
COMPOSITE SAFE AND ARMING MECHANISM FOR GUIDED MISSILE

Warren R. Hoelzen, Ontario; John F. Prescott, and Michael N. Tyler, both of Lake Isabella, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1980, Ser. No. 209,574
Int. Cl.³ F42C 5/00, 15/06
U.S. Cl. 102—264 8 Claims



1. A composite safing and arming mechanism for a missile launched from an aircraft having a warhead; and a rocket motor, said mechanism comprising:

a mechanism casing connected between said rocket motor and said warhead;

a port in said mechanism casing communicating with said rocket motor for allowing pressure therefrom to enter said casing;

means for receiving an initial signal from said aircraft attached to said mechanism casing;

means for initiating the rocket motor after a predetermined time attached to said casing adjacent the rocket motor; and

means for arming the warhead attached to said mechanism casing after receiving a predetermined amount of pressure through said port from said rocket motor.

4,372,213

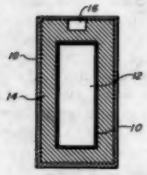
MOLTEN METAL-LIQUID EXPLOSIVE METHOD

Alexander G. Rozner, Potomac, and Horace H. Helms, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 28,478, Apr. 9, 1979, Pat. No. 4,280,409. This application Mar. 30, 1981, Ser. No. 249,046

Int. Cl.³ C06D *5/00*

U.S. Cl. 102—301 **10 Claims**



1. A method of causing an explosion comprising the following steps in order:

A. Placing a thermal device in a confined space which is filled with a liquid which consists essentially of water, wherein the thermal device comprises

(1) pyrotechnic material comprising a mixture of powders of

(a) nickel,

(b) metal oxide,

(c) an aluminum containing component selected from the group consisting of (i) aluminum and (ii) a mixture of from 50 to less than 100 weight percent of aluminum and from more than zero to 50 weight percent of a metal selected from the group consisting of magnesium, zirconium, bismuth, beryllium, boron, tantalum, copper, silver, niobium, tungsten, and mixtures thereof;

(2) means for igniting the pyrotechnic material; and

(3) a case enclosing the pyrotechnic material and the ignition means, wherein the case is composed of a metal selected from the group consisting of aluminum, magnesium, copper, and brass; and

B. igniting the pyrotechnic material of the thermal device to cause the explosion in the confined space.

4,372,214

EXPLOSIVE AUTO-ENHANCEMENT DEVICE

Edward T. Toton, Columbia, and Elihu Zimet, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1980, Ser. No. 185,076

Int. Cl.³ F42B *1/00*

U.S. Cl. 102—305 **12 Claims**

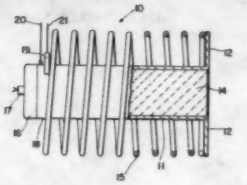
1. A device for enhancing the detonation wave pressure and detonation wave velocity in an explosive charge, comprising:

elongate means defining an armature and supporting an elongate explosive charge generally coextensive therein, said supporting means being electrically conducting;

means forming a magnetic field surrounding the elongate supporting means, said magnetic field forming means being directly electrically connected to the supporting means at a first end thereof;

said elongate supporting means having its other end disposed in close proximity to the means forming the magnetic field to define a crowbar switch therebetween; and

means at the other end of the elongate supporting means for initiating the explosive charge, the detonation wave of which travels toward the first end;



whereby, upon initial minimal expansion of the elongate supporting means at its other end, the crowbar switch is closed to complete a circuit between the electrically conductive supporting means and means forming the magnetic field so that expansion of the supporting means is opposed by the magnetic field and the explosive charge is precompressed ahead of the detonation wave thus increasing the detonation wave velocity as it travels along the explosive charge.

4,372,215

PROCESS AND APPARATUS FOR TRANSPORTING AND DROPPING A PLURALITY OF CHARGES CONTAINED IN A SINGLE CONTAINER AND CONTAINER EQUIPPED WITH SUCH AN APPARATUS

Roger Crepin, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed May 20, 1980, Ser. No. 151,669

Claims priority, application France, May 13, 1980, 79 13201

Int. Cl.³ F42B *25/02*

U.S. Cl. 102—387 **16 Claims**

1. Device for transporting and releasing a plurality of charges engaged on a vehicle by the engagement of a lug of said vehicle and suspension means of said charges, said charges contained in a single container comprising a shell, a noseconeshaped forward point, and a back cover, said device comprising: a plurality of modules, assembled longitudinally in the shell from front to back, each of said modules including extraction means capable of extracting said modules one by one, upon command by control means, through the rear of the shell, said modules each consisting of a cylindrical body containing a charge; and control and release safety means preventing issuance of release and operation commands to the modules as long

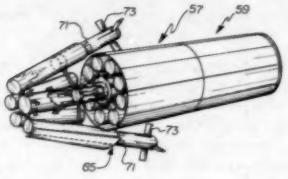
as said means suspending the container to said lug of said vehicle are not released.

4,372,216

DISPENSING SYSTEM FOR USE ON A CARRIER MISSILE FOR REARWARD EJECTION OF SUBMISSILES

George T. Pinson, and Alex B. Hunter, both of Huntsville, Ala., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1979, Ser. No. 107,023
Int. Cl.³ F42B *13/50, 25/16*
U.S. Cl. 102—489 10 Claims



1. An apparatus for ejecting submissiles from a carrier missile, comprising:

at least one launch tube means adapted to carry a submisile;

a support means;

first pivot means, connecting one end of said launch tube means to said support means;

actuator means which moves between a start position and an extended position;

lever means rotatably connected between said actuator means and the other end of said launch tube means; and

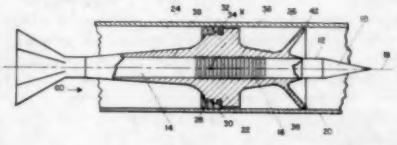
means for moving said actuator means between said start position and said extended position such that when said actuator means is in the start position, said launch tube means is in a stowed position, and when said actuator means is in the extended position, said launch tube means is in a position to eject the submissile therein.

4,372,217

DOUBLE RAMP DISCARDING SABOT

Richard D. Kirkendall, Havre de Grace; William H. Drysdale, Aberdeen; Louise D. Kokinakis, Fallston, and Bruce P. Burns, Churchville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 29,188, Apr. 12, 1979, Pat. No. 4,284,008.
This application May 12, 1980, Ser. No. 148,889
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—521 5 Claims



1. A double ramp discarding saboted projectile which comprises:

a subcaliber projectile having a cylindrically shaped forebody section, a cylindrically shaped aft body section, an externally grooved central body section disposed intermediate said fore and aft body sections, and a longitudinal axis;

a gun tube having a longitudinal axis in axial alignment with said longitudinal axis of said saboted projectile, said gun tube adapted for slidably supporting said saboted projectile therein during launch;

sabot means operatively connected to said subcaliber projectile for preventing premature propellant gas leakage through said sabot means and through interface surfaces between said sabot means and said subcaliber projectile, for propelling said saboted projectile through said gun tube with increased velocity, for obtaining uniform shear traction between the interface of said sabot means and said subcaliber projectile, and for initial guidance of said saboted projectile through said gun tube which includes;

a plurality of double ramp sabot segments, each of said segments having an aft tapered ramp section having an internal cylindrical interface surface which mates with said aft body section of said subcaliber projectile, a forward tapered ramp section having an internal cylindrical interface surface which mates with said forward body section of said subcaliber projectile, an internally concentric traction groove section which mates with said grooved central body section of said subcaliber projectile, and borerider means for performing initial guidance during early motion of said subcaliber projectile through said gun tube, said borerider means includes a conical shell member extending from a forward end of said forward tapered ramp section; and

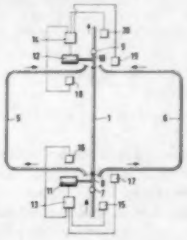
obturating band means fixedly connected to said sabot means and slidably disposed intermediate said sabot means and said gun tube, said band means positioned over the total in-bore center of gravity of said saboted projectile, for reducing the magnitude of transverse moments applied to said saboted projectile by yawing motions, for balancing said saboted projectile during in-bore travel through said gun tube, and for preventing leakage of propellant gases between said sabot means and said gun tube, said sabot means and said band means cooperating to eject said subcaliber projectile from said gun tube with improved leathality and range.

4,372,218

TRANSPORTATION INSTALLATION

Roland J. A. Östlund, Limmared, Sweden, assignor to Johnatic, Inc., Bellevue, Wash.

Continuation of Ser. No. 677,738, Apr. 16, 1976, abandoned.
This application Aug. 2, 1977, Ser. No. 821,076
Claims priority, application Sweden, Nov. 12, 1975, 7512683
Int. Cl.³ B61J *3/00*
U.S. Cl. 104—88 8 Claims



1. A conveyor system for serving a plurality of processing stations arranged in a plurality of substantially parallel rows, comprising

a plurality of trolley carriages,

an overhead main conveyor comprising a monorail track for said trolley carriages, said track forming a loop having a pair of substantially parallel sides along which the rows of processing stations are distributed, and means for propelling the trolley carriages along said track, said propelling means including a cable or chain slidably supported in guide means provided along said track above the same and

having depending dog members for engaging said trolley carriages,

a plurality of side conveyors coordinated with said processing stations, each of said side conveyors comprising a loop shaped overhead monorail track, each of said substantially parallel sides of the main conveyor being associated with one group of side conveyors to the right of said side and another group of side conveyors to the left of said side, and,

switch means for selectively connecting said side conveyors to the main conveyor, said switch means including, for each of said side conveyors, first switch means arranged in a first position to lead a trolley carriage along the main conveyor and in a second position to deviate a trolley carriage from the main conveyor to one end of a side conveyor, and second switch means for connecting the other end of the side conveyor to the same side of the main conveyor as said first switch means.

4,372,219

MATERIAL HANDLING SYSTEM

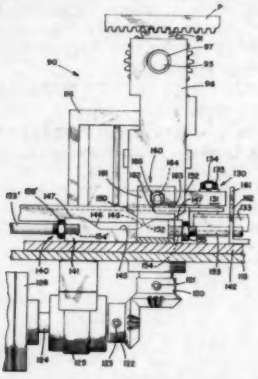
James W. Gibbs, Hialeah, Fla., assignor to Gibbs-Ryder Materials Handling Systems, Inc., Coral Gables, Fla.

PCT No. PCT/US79/00730, § 371 Date May 22, 1980, § 102(e) Date May 22, 1980, PCT Pub. No. WO80/00690, PCT Pub. Date Apr. 17, 1980

Continuation-in-part of Ser. No. 945,056, Sep. 22, 1978. This PCT application Sep. 17, 1979, Ser. No. 261,128

Int. Cl.³ B61B *13/02*

U.S. Cl. 104—165 **41 Claims**



1. Material handling apparatus for the controlled movement of goods comprising, two intersecting rail means, pallet means for supporting the goods, wheel means mounted on said pallet means for engaging said intersecting rail means, movable track section means in said intersecting rail means underlying said wheel means, means for selectively moving said movable track section means to permit movement of said pallet means in two angular directions, and drive means engaging said pallet means for selectively moving said pallet means along either of said two intersecting rail means, said drive means including drive direction control means for orienting a pinion to drive said pallet means along either of said two intersecting rail means and including direction control locking means for locking said pinion in position to drive said pallet means along either of said two intersecting rail means, said direction control locking means including lock plates having a cutout and said pinion being mounted on a shaft mounted on a yoke, said yoke having a lock pin engaging said cutout in said lock plates.

4,372,220

MOTOR VEHICLE FOR USE ON ROADS AND RAILWAYS

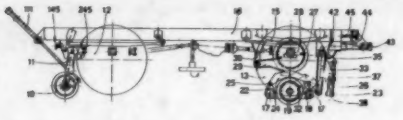
Lucio Sechi, Tricesimo, Italy, assignor to Danieli & C. Officine Meccaniche S.p.A., Buttrio, Italy

Filed Jul. 28, 1980, Ser. No. 172,666

Claims priority, application Italy, Jul. 27, 1979, 83428 A/79

Int. Cl.³ B61C *11/00*; B61F *13/00*

U.S. Cl. 105—215 C **4 Claims**



1. Motor vehicle for use on roads and railways comprising: driving tired road wheels; rail wheels temporarily positionable at least partially below the said road wheels, at least some of said rail wheels being driven in this temporary position by said road wheels; temporary positioning means provided for the said rail wheels; said positioning means consist of two jacks the first jack being for putting the driven rail wheels into the temporary working position and for the temporary transitory displacement of the said driven rail wheels, and the second jack being for putting the same unit of the driven wheels and first jack into the temporary disengaged position; a first lever; an axle integral with said first lever; a sleeve external to said axle and sustaining means anchored to said external sleeve, said first jack acting on said lever and being sustained by said means.

4,372,221

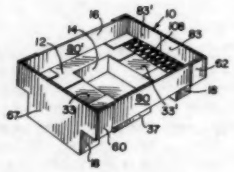
FOLDING PALLET

Herbert V. White, Borger, Tex., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Mar. 31, 1980, Ser. No. 135,411

Int. Cl.³ B65D *19/20*

U.S. Cl. 108—51.3 **9 Claims**



1. A pallet structure for supporting articles so as to facilitate handling and transporting by a fork lift truck which pallet structure is formed from a cut and scored blank of relatively heavy weight paperboard, or like foldable sheet material, said structure comprising an article supporting platform arrangement having a central portion thereof depressed so as to provide a pocket-forming, article-accommodating recess which is defined by a sidewall structure and a bottom wall structure, said sidewall structure comprising panels depending from the plane of the surrounding platform area to the perimeter of said bottom wall structure, which bottom wall structure is disposed in a plane a substantial distance below the bottom face of the surrounding platform area and said sidewall structure being spaced inwardly of the outermost edges of said platform structure on all sides a sufficient distance to permit the arms of a fork lift to be inserted from any adjoining sides of the pallet so as to engage in supporting relation beneath the platform while the bottom wall of the recess is resting on a supporting surface at a level below the bottom face of the platform, said platform

arrangement including an upstanding rim forming arrangement at its outer edges.

4,372,222

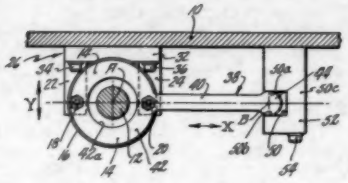
SCREW AND FLOATING DRIVE NUT ASSEMBLY

Larry E. Tice, Harrisburg, N.C., assignor to Colt Industries Operating Corp., West Hartford, Conn.

Filed Oct. 6, 1980, Ser. No. 194,459

Int. Cl.³ A47B 13/00; F16H 1/18

U.S. Cl. 108—137 **4 Claims**



1. In a precision screw assembly adapted to position table of the type having a screw and a ball nut in threaded engagement with the screw, the improvement comprising:

a rod connected to and extending from the ball nut in parallel relationship to the screw;

a first bracket mounted on the table and fixedly connected to the rod such that motion of the ball nut is transmitted to the table;

an arm connected to and radially extending from the nut;

a second bracket mounted on the table; and

the arm being anchored to the second bracket for pivoting movement with respect to the bracket about an axis generally parallel to the axis of the screw and for axial movement with respect to the second mentioned bracket such that the nut is prevented from rotating about its axis but is free to move sidewise and vertically.

4,372,223

MOVING TABLE ASSEMBLY

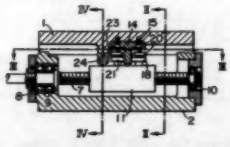
Nobuo Iwatani, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,259

Claims priority, application Japan, Dec. 20, 1979, 54-175621[U]; Feb. 6, 1980, 55-12899[U]

Int. Cl.³ A47B 1/00; F16M 11/04

U.S. Cl. 108—143 **5 Claims**



1. A moving table assembly having a table supported for movement in one direction, a feed screw having its axis parallel to the direction of movement of said table, a nut threadably engaged with said feed screw, and a connecting mechanism for connecting said table and said nut, said connecting mechanism comprising a first connecting portion for transmitting the axial displacement of said nut to said table and a second connecting portion for preventing said nut from rotating relative to the axis of said feed screw, said first connecting portion being provided with a guide member having a pair of guide surfaces provided on one of said table and said nut in orthogonal relationship with the axis of said feed screw, two support shafts corresponding to said guide surfaces respectively and secured to the other of said table and said nut, and two arms rockably provided on said support shafts respectively and having at the opposite ends thereof rotatable rollers engaging said guide surfaces, said rollers being pre-loaded against said guide surfaces by resilient deformation of said arms.

4,372,224

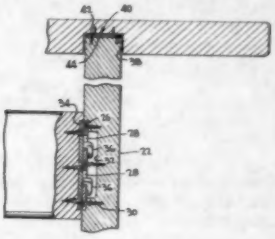
KNOCKDOWN FURNITURE CONSTRUCTION

Richard A. Ehrlich, Culpepper, Va., assignor to Gary J. Knostman, Fulton, Tex., Trustee of Metro Manufacturing of Texas and Metro Retailing of Texas, Inc.

Filed Feb. 7, 1980, Ser. No. 119,557

Int. Cl.³ C08L 89/00

U.S. Cl. 108—159 **6 Claims**



1. A knockdown furniture construction comprising:

a member having a generally rectangular configuration said member having a lower surface with a longitudinal recess formed at each end therof;

a pair of spaced apart generally I-shaped legs for supporting said member, each of said legs including an upper shoulder having a configuration mating with the configuration of said longitudinal recess at each end of said member for receivably mounting said upper shoulder therein; and,

separable fastener means for connecting said member with said legs including first and second complementary strips of gripping elements, said first strip of gripping elements being secured to said member within said longitudinal recess at a base thereof and said second strip of gripping elements being secured to said legs on an upper surface of said upper shoulder whereby said member can be sturdily but separably assembled with said legs when said second strip of gripping elements is in full face contact with said second strip of complementary gripping elements upon mating engagement of said upper shoulder with said longitudinal recess.

4,372,225

PANEL STRUCTURE FOR PUBLIC ENCLOSURES

Alain Tissot, 44 avenue de l'Abbaye, 77500 Chelles, and Claude Bourlier, 3, rue J.F. Belbeoch, 94410 St. Maurice, both of France

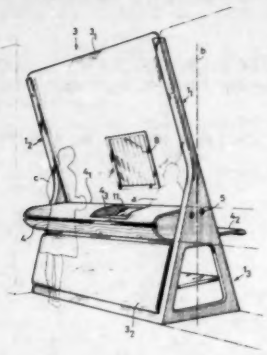
Filed Mar. 6, 1981, Ser. No. 241,239

Int. Cl.³ E06B 7/32

U.S. Cl. 109—19 **11 Claims**

1. In a constructional element in particular for the equipment of premises used by the public for defining between the public and an officer isolated in another premises a transparent separating structure which however permits oral communication and exchanges of objects or documents, the element comprising a counter having a substantially horizontal upper part, an upper separating wall surmounting the counter, a major part of which wall is made from a transparent material and is inclined with respect to the vertical upwardly and toward the public premises side, the element having a part located below the upper substantially horizontal part of the counter, a lower wall closing said lower part, the improvement wherein, apart from

the upper part of the counter, the upper wall and the lower wall, the constructional element comprises only two spaced-apart lateral posts which are contained in vertical planes and have elongated and inclined upper parts, between which upper



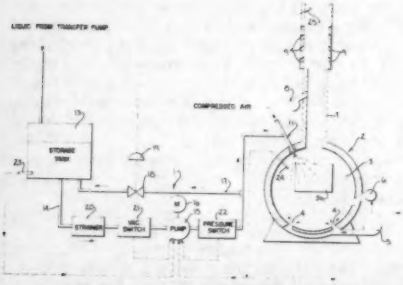
parts said upper wall is maintained, and wider lower parts which provide the element with a suitable supporting polygonal structure, the upper part of the counter and the lower wall being maintained between said lower parts.

4,372,226

LIQUID WASTE FEEDING SYSTEM FOR AN INCINERATOR

Kjell I. Eriandsson, Milwaukee, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Apr. 30, 1981, Ser. No. 258,993
Int. Cl.³ F23G 7/04
U.S. Cl. 110—238 **18 Claims**



1. An incinerator system, comprising an incinerator defining a combustion chamber, means for supplying solid waste material to the combustion chamber, a stack connected to the combustion chamber to discharge waste gases of combustion generated through burning of said waste material, a liquid waste feed assembly mounted for movement with respect to the combustion chamber from a retracted position wherein said assembly is located outside of said combustion chamber to an extended feed position wherein the assembly is in communication with said chamber, operating means connected to said feed assembly for moving said feed assembly between said retracted position and said feed position, liquid waste supply means for supplying liquid to said liquid waste feed assembly when said feed assembly is in said feed position whereby the liquid waste will be introduced into the combustion chamber and combusted with said solid waste and means responsive to a predetermined elevated stack temperature for actuating said operating means to move the liquid feed assembly from the retracted to the extended feed position.

4,372,227

METHOD OF REDUCING HIGH TEMPERATURE SLAGGING IN FURNACES

Dennis F. Mahoney, Three Bridges; Alfred E. Kober, Bridgewater, both of N.J., and Subhash H. Risbud, Champaign, Ill., assignors to Economics Laboratory Inc., St. Paul, Minn.

Filed Feb. 10, 1981, Ser. No. 233,064
Int. Cl.³ F23B 7/00; C10L 9/02
U.S. Cl. 110—342 **8 Claims**

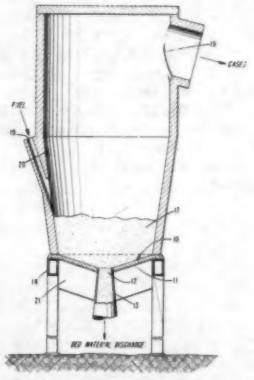
1. A method of ameliorating high-temperature slagging conditions which results from impaction on the boiler interior surfaces of molten or semi-molten ash particles in a flue gas resulting from the combustion of fuel, which method comprises (a) at or upstream of the high-temperature region in said boiler system where slagging tends to occur, but downstream of the combustion region proper, adding to said flue gas a conditioner comprising one or more finely divided substances from the group consisting of silicon carbide and aluminum nitride, and (b) thereafter causing said mixed flue gas and conditioner to flow through said region, whereby the cooled ash has a predominantly crystalline characteristic.

4,372,228

FLUIDIZED BED REACTOR UTILIZING A CONICAL-SHAPED SUPPORT AND METHOD OF OPERATING THE REACTOR

Jakob Korenberg, York, Pa., assignor to York-Shipley, Inc., York, Pa.

Filed Dec. 5, 1980, Ser. No. 213,318
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 **27 Claims**



1. A bed support for use in a fluidized bed reactor comprising:

conduit means for removing tramp material and/or agglomerated material from the reactor;

conical-shaped support including downwardly converging surfaces terminating in said conduit means; and

main air source means extending from said downwardly converging surfaces and directing a net component of pressurized air parallel to and downwardly along said surfaces toward said conduit means both for fluidizing the bed and for preventing tramp material and/or agglomerated material from collecting on said downwardly converging surfaces.

4,372,229

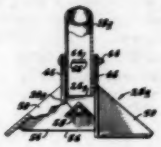
RUNNER PLANTER MEANS

Marcus D. Henthorn, Rte. 1, Roachdale, Ind. 46172

Continuation-in-part of Ser. No. 123,300, Feb. 21, 1980, abandoned. This application Feb. 24, 1981, Ser. No. 237,633

Int. Cl.³ A01C 5/00

U.S. Cl. 111—86 1 Claim



1. A planter runner assembly adapted to be attached to a planter, comprising a planter runner having a forwardly-located earth-parting component, and rearwardly thereof vertical side walls, which, when moved forwardly along the ground, provide between them a flat earth-shielded furrow into which seed is to be planted, and

a seed diverter means which is operative to distribute seed across the width of said furrow,

and a hood member formed to provide generally parallel side walls respectively attached to the vertical side walls of the planter runner, and earth-shielding walls extending transversely from the hood member's side walls, the said earth-shielding walls each diverging in a sloping manner outwardly and downwardly respectively from bottom edges of the hood member's side walls, and including a rearward cover means attached along the rear downwardly, rearwardly sloping edges of the said earth-shielding walls, said rearward cover means having a bottom transverse edge elevated above the lower edges of said earth-shielding walls and including means for mounting said seed diverter means,

whereby the combination of the earth-shielding transversely-extending walls and the rearward cover means shield the seeds being planted from earth falling into the furrow, generated by the forward movement of the planter, until the distribution of the seeds as spread by the seed diverter means has taken place.

4,372,230

PRESSER FOOT WITH CORDING ATTACHMENT

Heinrich K. Ciecior, Ettlingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,512

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003630

Int. Cl.³ D05B 29/12

U.S. Cl. 112—139 6 Claims

1. A cording presser foot for overedge sewing machines comprising:

work engaging sole plate means having a needle opening, a cord guiding channel arranged proximate to and in advance of the needle opening in the direction of sewing permitting a cord to be guided toward the needle opening, and an opening extending from one lateral side of the sole plate to the channel by a labyrinth.

4,372,231

BUTTONHOLE PADDLE SWITCH POSITION SENSING ARRANGEMENT IN A SEWING MACHINE

Charles R. Odermann, Montville, and John W. Wurst, Dover, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 7, 1981, Ser. No. 290,892

Int. Cl.³ D05B 3/06, 3/02

U.S. Cl. 112—158 B 7 Claims

1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, static memory means for storing pattern stitch information, means for selecting a pattern to be sewn, timing pulse generating means for generating timing pulses in synchronism with the operation of said sewing machine, means utilizing said timing pulses for recovering selected pattern stitch information from said static memory means, actuating means responsive to said pattern stitch information for influencing the feed and bight motions to produce a pattern of stitches corresponding to the selected pattern stitch information, a buttonhole presser foot including a button size gauging arrangement, a paddle switch adapted to cooperate with said button size gauging arrangement during the sewing of a buttonhole pattern so as to provide switching signals for forming an appropriate sized buttonhole, said paddle switch being selectively movable between a retracted non-operative position and an extended operative position, and inhibit means selectively operable for rendering inoperative at least one of the stitch forming instrumentalities, the improvement comprising:

signal generating means responsive to said paddle switch not being in its operative position when a buttonhole pattern is selected for generating a control signal; and

means responsive to said control signal for operating said inhibit means.

4,372,232

ELECTRONICALLY CONTROLLED SEWING MACHINE ARRANGED TO SEW THE MIRROR IMAGE OF A PATTERN IN THE FEEDING DIRECTION

William H. Dunn, Frankford Township, Sussex County, and Leonard I. Horey, West Orange, both of N.J., assignors to The Singer Company, Stamford, Conn.

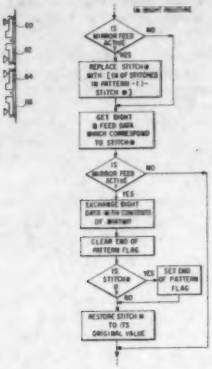
Filed Mar. 31, 1982, Ser. No. 364,120

Int. Cl.³ D05B 3/02

U.S. Cl. 112—158 E 3 Claims

2. An electronically controlled sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, means for storing pattern stitch information in an ordered sequence corresponding to the sequence of stitches within the pattern, the pattern stitch information for each stitch including separately identifiable bight and feed information, switch means actuatable by an operator to effect the sewing of the mirror image of the pattern in the feeding direction, and means responsive to actuation of said

switch means for sequencing through said pattern stitch information in the reverse order and wherein for each stitch in the



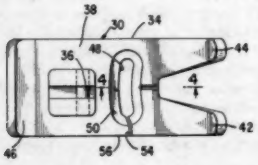
mirror image there is used the feed information for that stitch and the bight information for the succeeding stitch according to the original ordered sequence.

4,372,233

SAFETY GENERAL PURPOSE PRESSER FOOT FOR STRAIGHT AND ZIG ZAG STITCHING

Charles R. Odermann, Montville, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 12, 1981, Ser. No. 233,799
Int. Cl.³ D05B *29/06*
U.S. Cl. 112—235 **4 Claims**



1. In a zig zag sewing machine, a needle bar to which a sewing instrumentality with a pair of laterally spaced needles may be secured, a pressure bar, and a presser foot attached to the presser bar, the needle bar having a basting position beyond a lateral zig zagging range, said presser foot including a sole plate with a lateral elongate opening defined so that upon descent of the needle bar from the basting position only the needle closest to a mid-line in the zig zagging range can pass through the opening without striking the sole plate, the opening having an upper beveled edge to interfere at one end of the opening with the other needle and deflect such other needle so that it can pass through the opening.

4,372,234

FRAME STRUCTURE FOR A BLINDSTITCH HEMMING MACHINE

Karl H. Killinger, Dover; Kenneth M. Johnson, Westfield, and Peter J. Totino, North Bergen, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 14, 1981, Ser. No. 330,058
Int. Cl.³ D05B *77/00*
U.S. Cl. 112—258 **3 Claims**

1. A blindstitch sewing machine comprising: a two part frame including

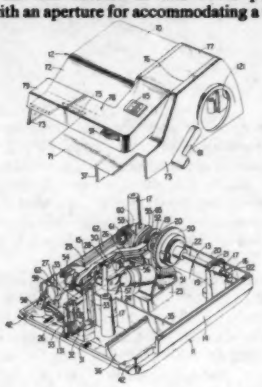
a base portion and

a cover portion mating congruently therewith,

said base portion including a substantially planar floor, walls rising from at least the sides and rear of said floor, and a plurality of bosses rising from said floor for supporting blindstitching mechanism thereon,

said cover portion including a low section extending from one side to the other across the entire front of said cover portion, a high rear section, a sloping ramp section joining said front and rear sections, and walls depending from at least the sides and rear of said cover portion,

a throat plate carried at one side of the two part frame adjacent the low section of said cover portions and formed with an aperture for accommodating a work fabric



bight projecting herethrough into the path of blindstitch forming instrumentalities supported within said frame base portion,

a presser arm pivotally secured at the opposite side of the two part frame from the throat plate on the high rear section of said frame cover portion,

said presser arm projecting forwardly from said high rear section of said cover portion extending over said low section of said cover portion, and having a thickness dimension less than the difference in height of said low and said high cover portion sections,

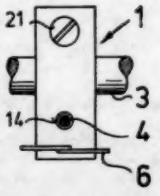
a presser device carried by said presser arm for urging work fabrics against said throat plate, and a ridge former carried by said presser arm for projecting a bight of work fabric through said throat plate aperture.

4,372,235

THREAD MONITORING DEVICE

Viktor Principe, Romanshorn, Switzerland, assignor to Arthur Schmid AG, Romanshorn, Switzerland

Filed May 26, 1981, Ser. No. 267,020
Int. Cl.³ D05B *69/36*
U.S. Cl. 112—273 **5 Claims**



5. A thread monitoring device for a multineedle sewing

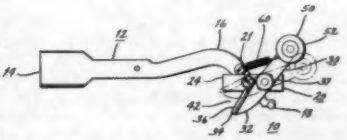
machine comprising a plurality of flexible contact arms mounted on said machine, one for each thread to be monitored, and maintained in a first position by the tension of the monitored thread, said contact arm being spring urged toward a second position upon the absence of the monitor thread, said machine being equipped with a current carrying rail adjacent said second position, a holder movably mounted on said rail and adapted to be releasably fixed thereon in alignment with at least one contact arm, said holder having a conducting plate depending from said rail in the path of movement of said contact arm as said contact arm moves toward said second position, a contact strip on said conducting plate engageable by said contact arm when the same moves toward said second position, an electrical circuit operably associated with said machine including a current source connecting said contact arm and said contact strip through said rail, holder and conducting plate and including an illuminable diode mounted on said conducting plate adjacent said contact strip, said diode being illuminated when said contact arm contacts said contact strip to complete the electrical circuit whereby said holder can be selectively positioned on said rail in alignment with any selected contact arm to indicate breakage of a monitored thread associated with said selected contact arm.

4,372,236

THREAD CUTTING DEVICE FOR SEWING MACHINE

William E. Harrison, Henderson, N.C., assignor to Interco Incorporated, St. Louis, Mo.

Filed Oct. 7, 1981, Ser. No. 309,356
Int. Cl.³ D05B 65/02
U.S. Cl. 112—291 **3 Claims**



1. A thread cutting device for use in combination with a sewing machine pressure arm comprising:
a stationary, essentially horizontal blade fastened to said pressure arm and having a lower cutting edge;
a pivoting blade attached to said stationary blade, having a lower cutting edge that forms a cutting field with said stationary blade;
pressure means for causing said pivoting blade to move into a cutting relationship with said stationary blade; and
tensioning means for maintaining said blade in a non-cutting relationship.

4,372,237

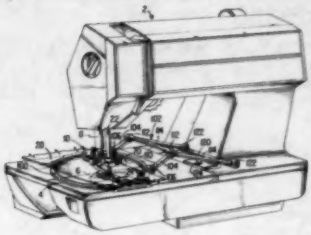
TWO DIMENSIONAL FEED FOR MONOGRAM SEWING MACHINE

Peter J. Totino, North Bergen, and Donald R. Davidson, Berkeley Heights, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 24, 1981, Ser. No. 334,194
Int. Cl.³ D05B 27/06, 27/20
U.S. Cl. 112—308 **5 Claims**

1. A sewing machine having a work supporting surface, a work holding frame, guide means for constraining said work holding frame in translatory motion with respect to said work supporting surface, presser means and underbed feeding means, means for urging said presser means and said underbed feeding means each into simultaneous cooperative engagement with the work piece during selected time periods for feeding the work piece in forward and reverse directions, means for rendering said urging means ineffective for time periods other than said selected time periods, and transverse feeding means effective during said time periods other than said selected time periods for feeding the work piece in directions other than said forward and reverse directions.

2. A sewing machine having a work supporting surface, a



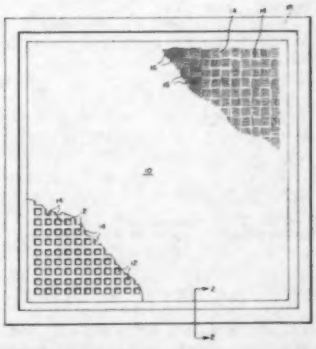
work holding frame for rigidly clamping the work piece while sewing, guide means for constraining said work holding frame in translatory motion with respect to said work supporting surface, and work feeding means for imparting longitudinal and transverse motion to said work holding frame through said work piece rigidly clamped therein during sewing.

4,372,238

TOY STITCHING SET

David J. Ciganko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 12, 1981, Ser. No. 224,275
Int. Cl.³ D05C 17/00; B03B 29/00
U.S. Cl. 112—439 **6 Claims**

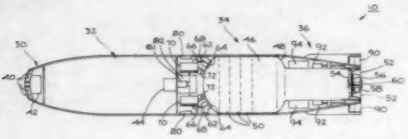


1. A toy stitching set comprising:
a rigid lattice plate having spaced perforations extending therethrough surrounded by lands to form a stitching grid wherein the width of each land between a pair of adjacent perforations is approximately 0.7 times the width of each perforation; and
a design of one or more colors imprinted on said lands whereby yarn matching the colors may be stitched to said grid to embroider said design.

4,372,239
UNDERSEA WEAPON WITH HYDROPULSE SYSTEM AND PERIODICAL SEAWATER ADMISSION

Allen C. Hagelberg, Diamond Bar; Clark E. Allardt, Claremont; Walter A. Lobitz, Westwood; Robert O. Thornburg, Blue Jay; George F. Zimmerman, Diamond Bar; Gary L. Letterman, Alta Loma, and John W. Helbron, Upland, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 3, 1980, Ser. No. 126,782
Int. Cl.³ F42B *19/00*
U.S. Cl. 114—20 A **25 Claims**



1. A weapon for destroying an underwater target comprising:

a housing;

a warhead mounted within the housing near the forward end thereof;

means for steering the weapon under water in response to steering control signals;

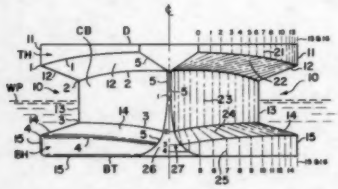
a hydropulse propulsion system including a chamber within the housing near the aft end thereof, a water jet nozzle projecting aft from the chamber, and means for periodically admitting sea water to the chamber and thereafter expelling the sea water through the nozzle with substantial force to develop thrust for propelling the weapon; and

a dual sonar system for seeking and detecting an underwater target and for generating signals to control the steering means to direct the weapon toward the target, said system including separate target seeking and detecting means which are selectively operable during different time periods in directing the weapon toward the target.

4,372,240
SURFACE SHIP HAVING IMPROVED SPEED AND MANEUVERABILITY

Farid Y. Michael, Orange, Tex.

Filed Jul. 23, 1980, Ser. No. 171,575
Int. Cl.³ B63B *1/00*
U.S. Cl. 114—56 **6 Claims**



1. A fast single hull surface ship having a top deck, a bottom, a starboard side, and a port side, said sides being symmetrical relative to a vertical longitudinal plane of symmetry;

said ship defining a bow section, a stern section, and a midbody section;

said bow and stern sections each having a transverse end surface;

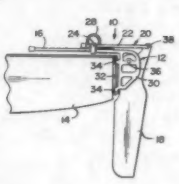
said starboard and port sides, each having an outwardly protruding upper side hull, an outwardly protruding lower side hull, and a channel between said upper and lower side hulls, each of said upper and lower side hulls having in the bow and stern sections an external cylindrical side wall;

in the bow and stern sections each of said channels having a recessed cylindrical wall which spans without interruption from the transverse end surface of the bow section up to the transverse end surface of the stern section, an upper inwardly-sloping side wall, and a lower outwardly-sloping side wall, the inwardly-sloping side wall having a conical portion whose area increases toward the end surface of the stern section, and whose area increases toward the bow section, and the outwardly-sloping side wall of said channel having a conical surface of reduced surface area up to the transverse end surface of the bow section and having a conical surface of reduced surface area up to the transverse end surface of the stern section.

4,372,241
RUDDER ASSEMBLY

William R. Tritt, 1145 Grove St., St. Petersburg, Fla. 33701

Filed Jan. 9, 1981, Ser. No. 223,728
Int. Cl.³ B63H *25/06*
U.S. Cl. 114—162 **7 Claims**

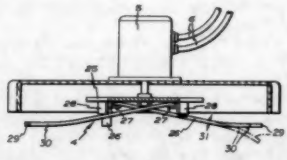


1. A rudder assembly for sailboats, and the like, comprising a rudder support frame pivotally attached to the stern portion of the boat, a tiller fixedly attached to the rudder support frame, said tiller being substantially horizontally disposed, a rudder blade pivotally coupled to the rudder support frame, a rudder blade control mechanism including kickup control arm pivotally coupled to said rudder blade and an interconnecting control member pivotally coupled between said kickup control arm and said tiller to selectively move said rudder blade between a first lower position, and second upper position by the pushing or pulling of said kickup control arm, said kickup control arm being substantially parallel to said substantially horizontal tiller when in said first or second position.

4,372,242
ASSEMBLY FOR TREATING VESSEL HULLS

Hans G. Lundberg, Löddeköpinge, Sweden, assignor to Marinkonsult Hans Lundberg AG, Trelleborg, Sweden

Division of Ser. No. 43,564, May 29, 1979, Pat. No. 4,279,212.
This application Mar. 30, 1981, Ser. No. 248,749
Claims priority, application Sweden, Jun. 1, 1978, 780643
Int. Cl.³ B63B *59/00*
U.S. Cl. 114—222 **11 Claims**



1. An assembly for treating an underwater surface of a fixed or floating construction such as, for example, a ship hull, the assembly having a frame which supports at least one motor-

driven rotatable treatment device which is moveable into abutment against the construction surface to be treated, wherein at least one of the treatment devices is a scraper having an axis of rotation extending between opposite ends of the scraper and comprising:

a holder which is disposed about the axis of rotation at one end of the scraper and which includes a plurality of supports oriented in an outward axial direction;

and

a like plurality of radially-extending scraper vanes which are made of resiliently yieldable material and which are associated respectively with said supports, each scraper vane having one end connected to the holder, an opposite free end, and an intermediate working portion adjacent the free end for scraping the construction surface, each scraper vane abutting against its associated support intermediate its connected end and its working portion, and each scraper vane extending from its associated support to its free end in a radial direction and simultaneously in said axial direction;

whereby when the scraper is moved in said axial direction into abutment against the construction surface, the free end of each scraper vane is compressed against the construction surface and the scraper vane resiliently yields, with its associated support acting as a fulcrum, to bring its working portion into abutment against the construction surface.

4,372,243

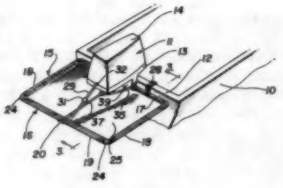
TOOL AND PARTS CATCHER FOR BOATS

John R. Roope, Jr., 6th and Grove Sts., Rehoboth Beach, Del. 19971

Continuation of Ser. No. 112,930, Jan. 17, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,342

Int. Cl.³ B63B *17/00*

U.S. Cl. 114—364 **1 Claim**



1. A device to prevent the loss of mechanics' tools by dropping into the water while repairing the motor of an outboard motorboat, the device comprising a frame including a pair of cooperative opposing generally C-shaped frame sections which define a generally rectangular frame when disposed in a common plane, the frame sections having parallel longitudinal side members and transverse rear members of equal lengths and the interior ends of the rear members being hingedly joined to permit folding the frame when not in use, the frame sections including foreshortened forward members having equal lengths whose inner ends are spaced apart sufficiently to straddle the sides of an outboard motor mounted on the transom of a boat to which the device is attached, a pair of suspension hooks for the device laterally adjustably mounted on said forward frame members and adapted to engage over the top of a boat transom on opposite sides of an outboard motor, at least one adjustable length flexible suspension element secured to one of said rear frame members and having a forward terminal element adapted for releasable connection with the frame of an outboard motor, whereby said device can be supported substantially horizontally immediately rearwardly of the transom of a boat, and a flexible barrier sheet adapted to intercept falling tools and the like and spanning substantially the rectangular area defined by said frame when the frame is in a use position, said barrier including a plurality of spaced suspension loops around its marginal edges and said loops being engaged with the side, rear and forward members of the frame to support the barrier sheet thereon in a generally taut state, the barrier sheet being divided at its front and transverse center between the forward frame members and said division of the barrier sheet extending longitudinally rearwardly to a point near the center of the barrier sheet, whereby the divided barrier sheet may straddle the descending portion of an outboard motor, and guide elements and a pair of flexible ties on the divided edge portions of the barrier sheet enabling the divided barrier sheet to be drawn snugly around said descending portion of an outboard motor.

4,372,244

VARNISHING UNITS ON PRINTING PRESSES

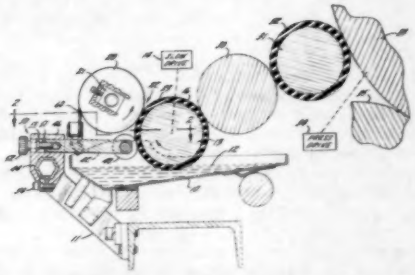
Herbert Rebel, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,531

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046257

Int. Cl.³ B05C *1/16*

U.S. Cl. 118—46 **4 Claims**



1. A varnishing unit for applying varnish in a strip of selected width on a sheet carried on the impression cylinder of a printing press comprising, in combination, a frame, a varnishing cylinder arranged for engagement with the sheet on the impression cylinder, a varnish trough, a resiliently surfaced fountain roller, driving means for slowly rotating the fountain roller in the varnish in the trough, a hard surfaced metering roller in rolling engagement with the fountain roller to form a metering nip, means for adjusting the degree of indentation of the metering roller upon the fountain roller thereby to determine the thickness of the film of varnish which clings to the fountain roller on the downstream side of the nip, a scraper blade on the metering roller on the downstream side of the nip for scraping off the varnish which clings to the metering roller for return thereof to the trough, a hard surfaced distributor roller in engagement with the fountain roller downstream of the nip for accepting the film of varnish, a resilient form roller in rolling engagement with the distributor roller for transferring the film to the varnishing cylinder, and a plurality of varnish blocking rollers arranged adjacent the fountain roller between the trough and the metering nip, the blocking rollers being hard-surfaced and of relatively small diameter, means including arms at the respective ends of each roller and secured to the frame for supporting the blocking rollers end to end so that each defines a region of width on the fountain roller for control of varnish flow, the arms having adjusting means for individual adjustment of each blocking roller between (a) a forcibly indented position on the surface of the fountain roller sufficient to substantially cut off the flow of varnish to the metering nip in the region of width controlled by the blocking roller and (b) a withdrawn position permitting passage of a strip of varnish in the controlled region to the metering nip and thence to the varnishing cylinder, the adjusting means at each

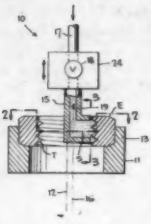
end of a blocking roller being differentially adjustable so that flow of varnish may be blocked off at one end of the blocking roller but not at the other thereby to achieve a varnish strip of a width which is less than the length of the blocking roller.

4,372,245

DEVICE FOR COATING INTERNAL THREADS OF A FASTENER

Colin Watson, Stillorgan, Ireland, and David J. Dunn, Twinsburg, Ohio, assignors to Loctite Corporation, Newington, Conn.

Filed Mar. 13, 1981, Ser. No. 243,517
Int. Cl.³ B05C *7/00, 5/02*
U.S. Cl. 118—56 **12 Claims**



1. A device for applying a sealant to the threads of an element having a circular threaded opening, comprising a hollow sealant applicator having a central axis and a sealant discharge orifice lying at a predetermined radial distance from said axis, a rotatable base for holding the element and positioning same with its threads adjacent said orifice and for rotating the element about a central axis of the base lying parallel to and offset from said applicator axis, whereby a side force is induced in the direction of said discharge orifice during rotation of said base to effect a forced discharge of sealant from said orifice into the threads of the element.

4,372,246

EXTERNALLY HEATED FUSING MEMBER FOR ELECTROSTATOGRAPHIC COPIERS

Jack C. Azar, Rochester; Arnold W. Henry, Pittsford, and Robert M. Ferguson, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 4, 1981, Ser. No. 260,649
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—60 **23 Claims**

1. An externally heated fuser member for use in an electrostatographic copying machine for fusing toner images to substrates comprising:

a base;

a relatively thick layer of a foam of a fluoroelastomer on said base; and

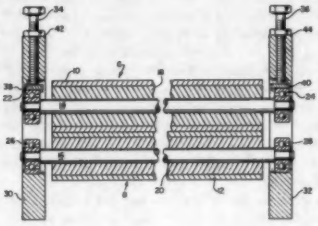
a relatively thin layer of a silicone elastomer on said foam layer, said silicone elastomer having an iron oxide filler dispersed therein.

4,372,247

COLD PRESSURE FUSING APPARATUS

Richard A. Calabrese, Newtown, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 124,034, Feb. 25, 1980, abandoned.
This application Dec. 21, 1981, Ser. No. 381,814
Int. Cl.³ B05C *1/08*; G03G *15/20*
U.S. Cl. 118—116 **5 Claims**



1. Fusing apparatus for fixing toner material to a copy sheet, comprising:

a pair of parallel, cold pressure fixing rollers, each of said rollers consisting of a cylindrical rigid metal tube open at both ends thereof, a cured elastomer occupying the volume enclosed by and bonded to said cylindrical tube, and a shaft extending through and bonded to said elastomer, said shaft being concentric with said tube; and

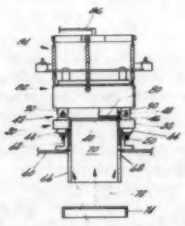
means for applying a force to one of the two roller shafts to thereby apply a uniform pressure to the nip of the cold pressure fixing rollers.

4,372,248

APPARATUS FOR ACCURATELY REGISTERING A MEMBER AND A SUBSTRATE IN AN INTERDEPENDENT RELATIONSHIP

Richard T. Martin, Goleta, Calif., assignor to Applied Magnetics-Magnetic Head Division Corporation, Goleta, Calif.

Filed Sep. 21, 1981, Ser. No. 304,066
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—720 **9 Claims**



1. Apparatus for accurately registering a substrate to a stabilized mask for direct deposition of a thin film material onto the substrate through the stabilized mask having a thin film pattern formed therein, said apparatus comprising

a mask supporting apparatus including

a stabilized mask assembly having a dimensionally stabilized mask supporting frame having an opening extending through the center thereof and means defining a circumferentially extending surface around the periphery of a said opening on one side of the dimensionally stabilized mask supporting frame, said dimensionally stabilized mask supporting frame including means for

defining a frame flange which supports said circumferentially extending surface;

a relatively thin, substantially planar mask formed of material having a predetermined yield strength and a selected geometrical shape and dimension, said mask being positioned adjacent said opening with the periphery thereof contiguous said circumferentially extending surface, said mask having a plurality of apertures extending therethrough and arranged in a predetermined array defining a thin film pattern;

means for rigidly affixing the periphery of said mask to the circumferentially extending surface with a radial tension applied to said mask, said radial tension having a magnitude which establishes a stress on the mask during use which is less than the predetermined yield strength of a said mask when said mask is used over a temperature range of a deposition process including operating temperatures of a deposition and being adapted to maintain sufficient magnitude to keep the mask under tension independent of variations in radial tension due to the thermal expansion characteristics of the mask to dimensionally stabilize said thin film pattern at a said operating temperature of a said deposition environment;

three prealigned registration members mounted on the frame flange of said dimensionally stabilized mask supporting frame in a predetermined pattern, a selected one of said prealigned registration members including a first adjusting means and an alignment pin and being adapted to move said alignment pin to a primary reference point in a selected plane and a selected second one of said prealignment members include a second adjusting means and an alignment pin and being adapted to move its associated alignment pin to a secondary reference line segment which excludes said primary reference point and which is located in said selected plane; and

gantry means including a substrate holding means for supporting a substrate in a predetermined relationship to a said source, said gantry means including reference registration members which are located thereon in substantially said predetermined pattern and which are adapted to co-act with the prealigned registration members for accurately registering a said substrate in a precise position relative to said mask supported by said dimensionally stabilized mask supporting frame, said reference registration members including receiving members each of which is adapted to receive and co-act with a selected one of said alignment pin of said prealigned registration members to insure that a said substrate is accurately registered relative to the mask rigidly affixed to said dimensionally stabilized mask supporting frame.

4,372,249

VOLUMETRIC APPARATUS FOR MILK AND METHOD OF MEASURING THE TOTAL QUANTITY OF MILK COLLECTED FROM A COW IN MILKING

Philippus P. Kiestra, Twijzel, Netherlands, and Christian Icking, Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde Westfalen, Fed. Rep. of Germany

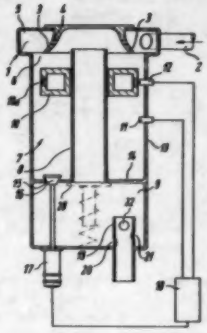
Filed May 22, 1981, Ser. No. 266,036

Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020161

Int. Cl.³ A01J 9/00

U.S. Cl. 119—14.17 **11 Claims**

1. In a device for directly measuring the quantity of milk obtained from a cow being milked by a mechanical milking apparatus, the device having a vacuum separating chamber receptive of a milk-air mixture from a cow for separating the milk from the air, a milk measuring chamber downstream of the separation chamber and having an outlet at the bottom thereof, means providing liquid communication between the separating and measuring chambers, means for sensing at least one liquid level in the measuring chamber and valve means for opening and closing the measuring chamber outlet in response to the liquid level sensed by the sensing means, the improvement wherein the means providing liquid communication between the separating and measuring chamber comprises a constantly open inlet aperture permitting a continuous flow of



milk from the separating chamber and further comprising means for making partial-quantity measurements of the milk during the flow of milk into the measuring chamber.

4,372,250

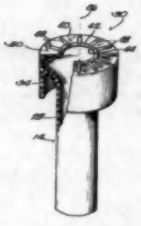
MILKING INFLATION

Leigh R. Larson, Johnson Creek, Wis., assignor to Hi-Life Rubber, Inc., Johnson Creek, Wis.

Filed Jul. 16, 1981, Ser. No. 280,454

Int. Cl.³ A01J 5/04

U.S. Cl. 119—14.47 **5 Claims**



1. A milking inflation for a teat cup assembly, said inflation being made from a elastomeric material, having a tubular body and having a head end portion adapted to fit over the upper end of a teat cup shell terminating in a upper rim, said head end portion including

(a) a peripheral cuff adapted to surround and sealingly engage the upper rim of the shell;

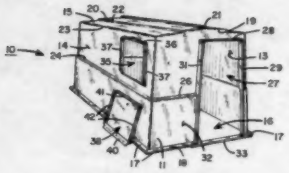
(b) a substantially flat web section extending radially inwardly from said cuff substantially perpendicularly to the longitudinal axis of the tubular body and terminating in a raised, rounded bead which defines a circular central opening for receiving a teat of a cow; and

(c) a plurality of circumferentially-extending ribs formed integrally with and spaced radially outwardly from said bead and also formed integrally with and projecting axially outwardly from the exterior surface of said web section.

4,372,251
PREFABRICATED ANIMAL SHELTER

Alfred H. Keith, Minneapolis, Minn., assignor to Dairy Farm Leasing Company, Minneapolis, Minn.

Filed Mar. 27, 1981, Ser. No. 248,249
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—16 10 Claims

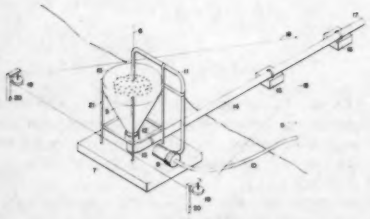


1. In a prefabricated animal shelter housing for calves and the like having front and back end walls, first and second opposite side walls and a top wall defining an open-bottomed portable shelter chamber for a relatively newborn animal, the improved combination in which the front end wall has a constantly open, laterally-offset animal door opening close to the first side wall and a closed front end wall portion extending laterally from the second side wall to the door opening, said closed end wall portion and second side wall providing a sheltered front corner area within the housing dimensioned to accommodate and protect at least the head and front leg and body portions of an animal standing crosswise along the front wall within the housing, and in which the upper portion of the second side wall has a feed opening close to the front end wall for insertion and removal of animal feed within the sheltered corner area; a cover for selectively closing and uncovering said feed opening, and externally and manually operable cover retaining means for selectively holding the cover in a position fully closing the feed opening, said animal door constituting the only substantial opening in said side and end walls when said cover is held in said fully closed position and said animal door opening having a top edge close to the top of the front wall.

4,372,252
FLOATING FISH FEEDER

Edward E. Lowry, Jr., P.O. Box 550, Greensboro, Ala. 36744

Filed Aug. 20, 1981, Ser. No. 294,558
Int. Cl.³ A01K *61/02*
U.S. Cl. 119—51 R 2 Claims



1. A device for broadcasting pelletized, granualized and powdered material over the surface of a water impoundment, comprising a hopper, a floating conduit, a pipe jet, and pumping means;

said hopper having sides sloping downward and inward to and terminating at a slightly truncated apex, said truncated apex connected to an ell joint, wherein said ell joint is swiveled about the vertical axis of said hopper;

said floating conduit comprising a conduit having floatation means attached thereto and spaced along its length; said conduit being attached to the lower end of said ell joint, and swiveled about the vertical axis of said hopper;

said pipe jet comprising a pipe, with a nozzle, which is aligned vertically over the truncated apex of the hopper, the nozzle of which terminates in the region of the truncated apex of the hopper; said pipe connected at its other end to said pumping means;

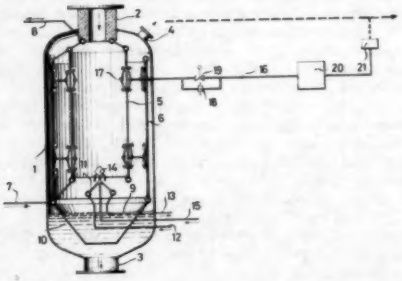
said pumping means comprising a supply conduit through which water is supplied in sufficient capacity to direct water through the pipe jet with sufficient velocity to entrain the material in the hopper;

wherein the material in the hopper is entrained in water at the region of the pipe jet nozzle and forced through the floating conduit and out its terminus over the surface of the water impoundment.

4,372,253
RADIATION BOILER

Josef Hibbel; Bernard Schleper, and Heinrich Scheve, all of Oberhausen, Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,698
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940257
Int. Cl.³ F22D *1/04*; B01D *47/02*
U.S. Cl. 122—7 R 7 Claims



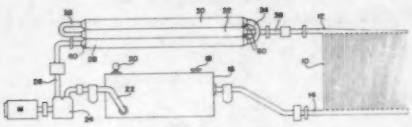
1. In a radiation boiler for cooling a gas stream containing solid and molten particles, comprising feed means for introducing said gas vertically at the top of said radiation boiler, a cooled gas outlet and a water bath disposed at the bottom of said radiation boiler for removing said particles after they have been solidified and cooled, the improvement wherein there is disposed between said feed means and said water bath at least two concentrically arranged cylindrical tubular heat exchange elements vertically disposed in the boiler and forming at least one annular passage therebetween, the passage through the innermost heat exchange element being in fluid flow registry and fluid flow communication with said feed means, a conical deflector having the axis thereof coincident with that of the innermost heat exchange element and thereby in registry with the flow of gas passing through the passage through the innermost heat exchange element and disposed toward the bottom of said radiation boiler above said water bath but at least partially below the lower end of the innermost heat exchange element whereby gas which strikes the conical surface of said conical deflector is deflected and passes through said at least one annular passage and in the passage of the innermost heat exchange element.

4,372,254

HYDRAULIC HEAT GENERATOR

Edmund Hildebrandt, 6 Cedar St., Clinton, Mass. 01510

Filed Jan. 23, 1981, Ser. No. 227,626
Int. Cl.³ F22B 3/06
U.S. Cl. 122—26 15 Claims



1. A hydraulic heat generator comprising a source of hydraulic fluid, a pump therefor, a heating element, and a heat diffusing means, and means placing the source, pump, element and means in circuit,

said heating element including an elongated generally hollow member and a pair of sets of relatively fixed generally complementary interfitting free-ended, opposed finger-like members therein, said sets of finger-like members together defining a zig-zag path for the hydraulic fluid through the heating element,

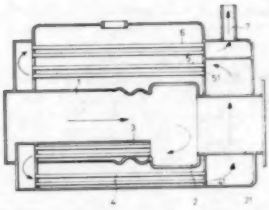
said pump acting to pump the fluid under pressure through the entire path.

4,372,255

FIVE-SMOKE-FLUE TYPE WET WATER BOX BOILER

Chi C. Hung, No. 1246-6, Sec. 2, Wan Shou Rd., Kuei Shan Hsiang, Tao Yuan Hsien, Taiwan

Filed Dec. 8, 1980, Ser. No. 214,108
Int. Cl.³ F22B 7/12
U.S. Cl. 122—149 1 Claim



1. A boiler comprising:

an axially-horizontal cylindrical shell charageable with water and having a central axis and two ends;

a first smoke flue of relatively large diameter extending from one end of said shell to a position nearer to the other end of the shell in parallel to said axis and directly receiving hot products of combustion;

a wet-type heat-absorbing water box adjacent said other end and within said shell being connected to said first smoke flue at said position nearer to said other end, said water box having an extension beyond said other end;

a second smoke flue comprising a plurality of fire tubes positioned in two bundles horizontally adjacent to and parallel to said first smoke flue and extending from a side of said water box nearest said one end to said one end;

a substantially semi-circular first return chamber at said one end for reversing direction of flow of the products of combustion from said second smoke flue;

a third smoke flue comprising a plurality of fire tubes substantially semi-circularly around and parallel to said first and second smoke flues extending from said first return chamber to said other end, said third smoke flue substantially semi-circularly surrounding said water box;

a second return chamber at said other end for reversing direction of flow of the products of combustion from said third smoke flue, said second return chamber surrounding said extension of said water box;

a fourth smoke flue comprising a plurality of fire tubes arranged above and parallel to said first, second and third smoke flues extending from said second return chamber to said one end;

a partially semi-circular third return chamber at said one end for reversing direction of flow of the products of combustion from said fourth smoke flue, the third return chamber having a shape that complements a shape of the first return chamber to match the cylindrical shape of the shell;

a fifth smoke flue comprising a plurality of fire tubes arranged above and parallel to said fourth smoke flue extending from said third return chamber to said other end; and

a chimney connected to said fifth smoke flue at said other end of said shell;

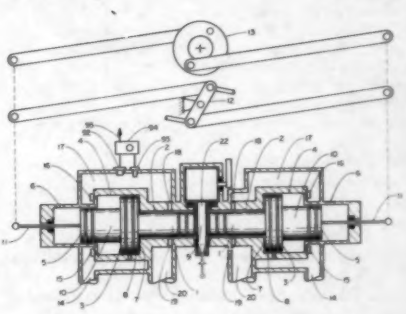
the products of combustion being passable serially through said first smoke flue, said water box, said second, third, fourth and fifth smoke flues for heating water charged in said shell.

4,372,256

CHAR BURNING FREE PISTON GAS GENERATOR

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed May 14, 1981, Ser. No. 264,105
Int. Cl.³ F02B 71/00, 71/02
U.S. Cl. 123—23 34 Claims



1. A free piston gas generator comprising:

a free piston mechanism comprising a power cylinder with a number of power pistons operative within each such power cylinder equal to two minus the number of cylinder heads on said power cylinder, said number of cylinder heads not exceeding one, each such power piston and each such cylinder head comprising a compressing surface with said compressing surfaces facing toward each other;

a combustion chamber secured inside the power cylinder of said free piston mechanism and comprising; means for containing char fuel and ashes so that said char fuel and ashes are mechanically separated from the power cylinder and power piston; said means for containing further comprising a refuel end through which refueling takes place, said means for containing further comprising gas flow passages which connect from that interior space of said containing means within which the char fuel and ashes are contained to that interior space of said power cylinder contained by said power cylinder and said compressing surfaces; each free piston gas generator being equipped with at least one of said combustion chambers for each free piston mechanism;

A refuel mechanism comprising; means for sealing that refuel end of said means for containing char fuel and ashes, through which refueling takes place, against gas leakage during compression and expansion processes; means for refueling fresh

char fuel at intervals into said means for containing char fuel and ashes; each free piston gas generator being equipped with at least one of said refuel mechanisms for each free piston mechanism;

a reload mechanism comprising: means for reloading a quantity of fresh char fuel into said means for refueling after each such refueling; each free piston gas generator being served by at least one reload mechanism.

4,372,257

DRIVE AGGREGATE FOR A HEAT PUMP

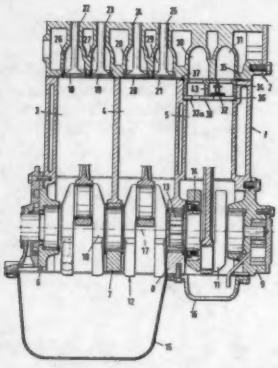
Peter Hofbauer; Erich Gaschler, and Cornelia Schwarz, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,537

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908432

Int. Cl.³ F02B *17/00*

U.S. Cl. 123—68 4 Claims



1. In a drive aggregate for a heat pump, including a cylinder block defining cavities for forming at least one cylinder of an internal combustion engine and at least one cylinder of a compressor driven by the engine; a common crankshaft passing through said cylinder block for serving both the engine and the compressor; and a plurality of bearings mounted in said cylinder block and supporting said crankshaft; the improvement wherein said cavities all have the same height dimension; further comprising a valve carrier plate sealingly secured in each cavity which forms a compressor cylinder; a compressor valve supported by said valve carrier plate; said valve carrier plate defining an end of the compressor cylinder formed by the respective cavity; a cylinder head secured to said cylinder block and extending over all said cylinders; each compressor cylinder having a top end oriented towards said cylinder heads; said valve plate being spaced from said cylinder head and from the top end of the respective compressor cylinder and being situated in its entirety within a respective said compressor cylinder; engine valves associated solely with each said engine cylinder and being mounted in said cylinder head; said cylinder head having a plurality of predetermined locations adapted to accommodate valve guide passages in the zone of each cylinder; means defining throughgoing valve guide passages solely in the predetermined locations associated with the engine cylinders for accommodating and guiding parts of said engine valves, whereby said predetermined locations of said cylinder head in the zone of each compressor cylinder being void of throughgoing valve guide passages for sealing said cylinder head in the zone of each said compressor cylinder.

4,372,258

LUBRICATING SYSTEM FOR OUTBOARD ENGINE

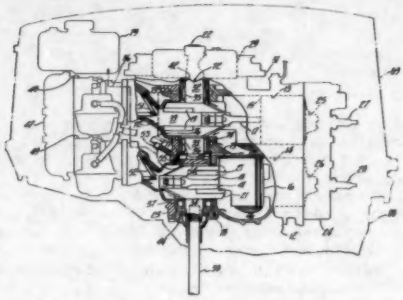
Tomio Iwai, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Jun. 26, 1981, Ser. No. 277,698

Claims priority, application Japan, Jun. 27, 1980, 55-87574

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 AD 5 Claims



1. A lubricating system for a crankcase compression, two-cycle, multi-cylinder engine having a vertically disposed crankshaft rotatably supported in a crankcase divided into at least an upper chamber and a lower chamber, seal means cooperating with said crankshaft for sealing said uppper crankcase chamber from said lower crankcase chamber, an oil pump drive means affixed to said crankshaft in said lower chamber contiguous to said seal means, means for delivering pressurized oil from the oil pump driven by said oil pump drive means to said oil pump drive means and therefrom to at least some of the moving components within said lower crankcase chamber.

4,372,259

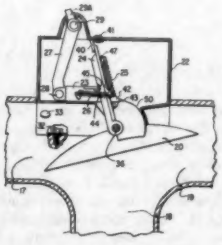
INTERNAL COMBUSTION ENGINE

George Vosper, 149 Earl St., Kingston, Canada (K7L 2H3)

Filed Aug. 28, 1980, Ser. No. 182,029

Int. Cl.³ F01L *1/28*

U.S. Cl. 123—79 R 2 Claims



1. In a fuel injected, internal combustion engine of the type having a single poppet valve for controlling the flow of air to the combustion chamber and exit of exhaust gases therefore, the improvement comprising:

(a) an inlet passage for the supply of air under pressure;

(b) an outlet passage for exit of exhaust gases, said outlet passage communicating with said inlet passage as a continuation thereof;

(c) a further passage terminating at one end in said combustion chamber and at the other end at the junction of said inlet and outlet passages, said single poppet valve being arranged and operated to control the flow of gases

through said further passage into and out of said combustion chamber in timed relation to rotation of the engine's crankshaft, all of said passages being circular in cross-sectional shape;

(d) a spoon shaped diverter valve disposed within a housing removably mounted and located at the junction of said inlet and outlet passages, said diverter valve being selectively moveable in timed relation with opening and closing of the poppet valve so as in one position to direct flow of pressurized air through the inlet passage into the combustion chamber and later, in another position, the flow of combustion gases from the combustion chamber through the outlet passage; and

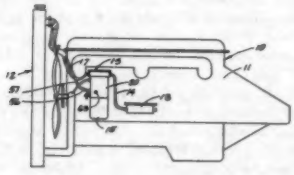
(e) an over centre snap action spring biased means controlling movement of said diverter valve from each of one position to another and controlled such that when moved from said another to said one position the initial movement is slow allowing pressurized air to flow directly from said inlet passage to said outlet passage to assist in driving out the exhaust gases.

4,372,260

ENGINE FLUID HEATER

Wayne Baker, 1315 Richardson, Lewiston, Id. 83501

Filed Sep. 26, 1980, Ser. No. 191,347
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—142.5 E **16 Claims**



1. A fuel heater that can be mounted to an internal combustion engine on the original engine fuel filter mount having fuel intake and discharge passages for mounting a removable fuel filter having fuel intake and discharge passages in axial alignment with and complementary to those of the fuel filter mount, said heater comprising:

a hollow heater body having top and bottom ends;

first mounting means on said heater body at the top end thereof adapted to mount the heater body in alignment with the fuel filter mount;

second mounting means on said heater body at the bottom end thereof adapted to releasably mount a fuel filter in alignment with the fuel filter mount;

fuel intake means between said first and second mounting means adapted to openly and axially interconnect the fuel intake passages of the fuel filter mount and a fuel filter mounted to said second mounting means;

fuel discharge means between said first and second mounting means adapted to openly and axially interconnect the fuel discharge passages of the fuel filter mount and a fuel filter mounted to said second mounting means; and

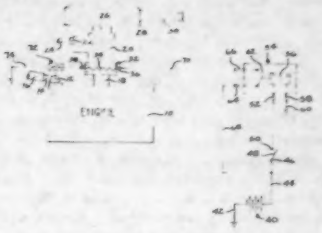
heat exchanger means adjacent the intake and discharge means adapted to heat fuel within the hollow heater body between the first and second mounting means thereof.

4,372,261

PRE-START ENGINE HEAT SYSTEM

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 14, 1980, Ser. No. 196,804
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—142.5 E **3 Claims**



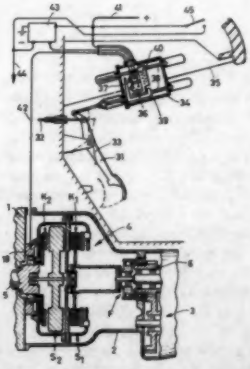
1. In a vehicle with an engine having self-starting means activated by manual efforts of an operator while in a normal driving position, an engine fluid inlet preheating system adapted to be initiated prior to said manual starting efforts, comprising: an electrically powered heating grid across the engine fluid inlet; a battery in circuit with the heating grid for energizing same; control circuit means between the battery and heating grid for initiating energization prior to said manual starting efforts of the vehicle operator, the control circuit including switch means operated in response to and incidental with an anticipatory action of the vehicle operator in entering the vehicle whereas the heating grid is preheated by electrical power from the battery during the interval between closing the switch by the operator's incidental anticipatory action and the manual engine starting efforts by the operator.

4,372,262

STOPPING AND RESTARTING DEVICE FOR THE INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Herbert Kaniut, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 22, 1981, Ser. No. 304,473
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 J **5 Claims**



1. Apparatus for stopping and restarting the engine of a motor vehicle in response to movement of the vehicle accelerator pedal to and from a closed engine throttle position, includ-

ing, a freely rotatable flywheel, a first friction clutch means driven by the engine and movable into frictional engagement with the flywheel for the drive thereof, a second friction clutch means for connecting the engine to the vehicle gearing, first electrically operated servo means for engaging the first clutch means, second servo means for engaging the second clutch means, an electrical circuit including switch means movable between a first position establishing the engine ignition circuit and supplying fuel to the engine and energizing the first servo means to drive the flywheel from the engine and movable to a second position interrupting the ignition circuit and the fuel flow to the engine and deenergizing the first servo means thereby permitting a free rotation of the flywheel, means operatively connecting the vehicle accelerator pedal and the switch means for moving the switch means from the first position to the second position in response to release of the accelerator pedal to a closed engine throttle position to shut off the engine and movable back to the first position in response to depression of the accelerator pedal to reenergize the first servo means to reconnect the flywheel and engine crankshaft to thereby provide a drive and restart of the engine by the flywheel, and time delay means in the electrical circuit operable upon release of the accelerator pedal to delay interruption of the ignition circuit and interruption of the fuel supply for a predetermined time period.

4,372,263

APPARATUS FOR STARTING INTERNAL COMBUSTION ENGINES

Paul Costa, 3940 7th Ave. SW., Golden Gate, Fla. 33999

Filed Mar. 30, 1981, Ser. No. 249,147
Int. Cl.³ F02N *11/12*
U.S. Cl. 123—179 SE **3 Claims**

1. Apparatus for coupling a hand held electric drill to a threaded upper end of an engine shaft of an internal combustion engine for cranking and starting the engine comprising:

an elongated nut which is axially threaded so that said nut can be screwed onto the threaded end of the engine shaft, said nut having two identical V-shaped slots in one end of the nut, the first side of each slot lying parallel to the axis of the nut, and the second side of the slot lying at an angle of substantially 60° to the first side with the apex of the V-shaped slot rounded to provide a smooth incline from the rounded apex to the end of the nut, and

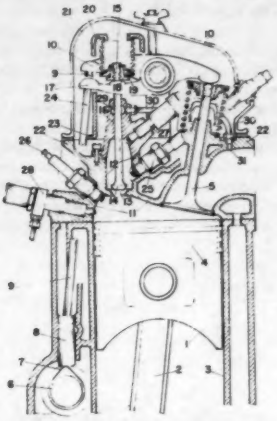
a tool made from a flat faced bit which can be coupled to be driven by said electric drill, said bit terminating in a flat sharp pointed tip and two sharp cutting edges at right angles to the axis of the bit for boring holes in wood, said tool being made by grinding off the tip of the bit to form a projecting flange and rounding off the cutting edges of the bit to form two edges which fit into the rounded apex of the two slots in the nut.

4,372,264

INTERNAL COMBUSTION ENGINE FOR DIVERSE FUELS

Horacio A. Trucco, 13 Saddler Ct., Huntington Station, N.Y. 11746

Filed Dec. 26, 1979, Ser. No. 107,338
Int. Cl.³ F02B *19/10*
U.S. Cl. 123—255 **14 Claims**



1. A device that operates in conjunction with an internal combustion engine to produce intermittent vaporization of discrete amounts of fuel that are subsequently utilized in the operation of an internal combustion engine comprising in combination, a fuel vaporizer chamber, a vaporizer valve, means to cyclically open said vaporizer valve to replenish said fuel vaporizer chamber with hot gaseous products of combustion generated by an internal combustion engine, means to cyclically introduce into said fuel vaporizer chamber metered amounts of fuel that vaporize by absorbing heat from said replenished hot gaseous products of combustion; means to close said vaporizer valve such as to temporarily entrap inside said vaporizer chamber said replenished hot gaseous products of combustion and said metered amount of fuel, means to cyclically open said vaporizer valve to discharge the resulting mixture of said vaporized fuels and said replenished hot gaseous products of combustion supplying an internal combustion engine in a mode to form a combustible mixture.

4,372,265

CONTROL CIRCUIT FOR ENGINE SPEED GOVERNOR WITH POWER TAKE OFF

Stanley J. Kasiewicz, 1807 Harvest Ln., Bloomfield Hills, Mich. 48013

Filed Jul. 14, 1980, Ser. No. 167,964
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—352 **10 Claims**

1. In a speed governing system for an engine having a throttle control means, said system being of the type including,

a reversible motor adapted to be connected with the throttle control means for actuating the control means selectively in a close throttle direction and open throttle direction,

speed sensing means adapted to be connected with said engine for developing a speed voltage corresponding to engine speed,

first and second switching means for energizing said motor in the close throttle and open throttle directions respectively,

logic means operatively coupled with the sensing means and said switching means for energizing the motor in a close throttle direction when the engine speed exceeds a first

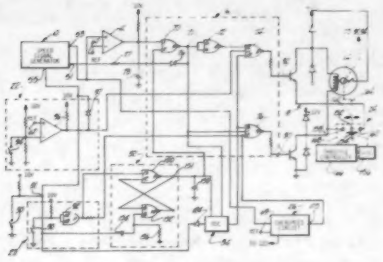
predetermined value and for energizing the motor in an open throttle direction when the engine speed is less than said first predetermined value,

said system being characterized in that it includes,

a mode selector switch for selecting a first or a second mode of operation,

a close throttle switching means actuated by said throttle control means for deenergizing said motor when the throttle control means reaches a close throttle reference position,

and an open throttle switching means actuated by said throttle control means for deenergizing said motor when the throttle control means reaches an open throttle reference position,



disabling means operatively coupled with said open throttle switching means for disabling it,

said mode selector switch being coupled with said disabling means to disable the open throttle switching means when the first mode of operation is selected whereby the motor is operative to actuate the throttle control means in the open throttle direction past the open throttle reference position to the wide open throttle position,

said open throttle switching means being operative when the second mode of operation is selected to deenergize said motor when the throttle control means reaches said open throttle reference position.

4,372,266

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

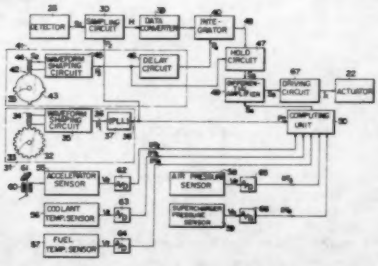
Yasuhiro Hiyama, Musashino; Hidekazu Oshizawa, Kumagaya; Kenji Okamoto, Higashimatsuyama, and Masayoshi Kobayashi, Kawagoe, all of Japan, assignors to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,001

Claims priority, application Japan, Jun. 30, 1980, 55-087934

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—357 **7 Claims**



1. A fuel injection apparatus for internal combustion engines, in which said apparatus has a fuel injection pump having a member for adjusting the amount of fuel injected from an injection nozzle, said apparatus comprising:

an actuator for driving said member;

a first signal generator for generating a first signal indicative of the optimum amount of fuel to be injected under the existing engine operation conditions;

a detector for generating a position signal indicative of the position of a needle valve of the injection nozzle at every instant;

a second signal generator for generating a second signal indicative of the actual amount of fuel injected on the basis of the change in said position signal;

means for comparing said first signal with said second signal; and

a circuit for driving said actuator in accordance with the resulting signal from said comparing means so as to bring the actual amount of fuel injected into accord with the optimum amount.

4,372,267

FUEL PUMPING APPARATUS

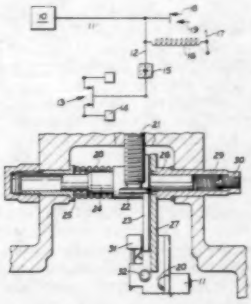
Graham L. Adams, Potters Bar, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 18, 1981, Ser. No. 235,567

Claims priority, application United Kingdom, Feb. 20, 1980, 8005640

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—366 **4 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising an injection pump, an axially movable control rod the axial position of which determines the amount of fuel supplied by the injection pump at each delivery stroke, speed responsive means for moving the control rod with increasing speed in the direction to reduce the amount of fuel supplied by the injection pump, a governor spring acting to oppose movement of the control rod by the speed responsive means, a plate movable laterally relative to the direction of movement of the control rod and engageable with a part of the control rod, an axially movable shaft mounting said plate, said plate having a stop surface for engagement with said part of the control rod and a further surface engageable with an adjustable abutment carried by a housing of the apparatus, said adjustable abutment acting to determine the position of the stop surface, said plate when in an operative position acting to limit the extent of movement of the control rod in the direction to increase in use the amount of fuel delivered by the apparatus, said plate being movable to an inoperative position to allow further movement of the control rod in a direction to increase in use the amount of fuel delivered by the apparatus, first resilient means acting to bias said plate to the inoperative position, and second resilient means acting when the temperature to which it is exposed attains a predetermined value to move said plate to its operative position, said second resilient means being formed as a coiled

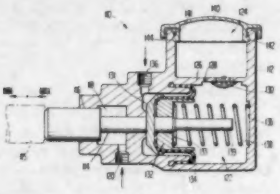
compression spring from an alloy whereby when the temperature is below said predetermined value the spring assumes a close coiled state and when the temperature is above said predetermined value the spring expands and behaves as a normal spring.

4,372,268

APPARATUS FOR CONTROLLING FUEL FLOW

Oldrich Kolarik, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jul. 11, 1979, Ser. No. 56,645
Int. Cl.³ F02M *39/00*; F02D *1/04*
U.S. Cl. 123—383 **5 Claims**



1. An apparatus for controlling a fuel flow to a diesel engine comprising:

(a) a housing;

(b) a locating member having a first portion projecting from said housing for engagement by a fuel control member and a second portion extending into said housing and reciprocally moveable therein;

(c) said housing having first and second chambers for containing hydraulic fluid, said chambers being positioned for fluid flow therebetweeen;

(d) a movable member, arranged for movement within said first chamber in sealing relationship therewith, said movable member connected to said locating member and arranged for transmitting pressure imparted to the second portion of said locating member to fluid in said first chamber;

(e) means for restricting flow of fluid from said first chamber into said second chamber to retard movement of said locating member in a controlled manner into said housing and permitting movement of said locating member in a substantially unrestricted manner away from said housing; and

(f) an override connecting means for applying pressure to said locating member in a direction of greater extension of said locating member from said housing, said pressure being greater than the pressure urging said locating member in the direction of lesser extension of said locating member from said housing.

4,372,269

INTERNAL COMBUSTION ENGINE

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

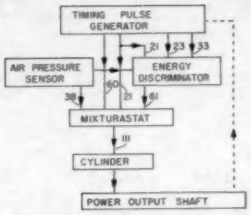
Continuation-in-part of Ser. No. 200,369, Oct. 24, 1980, Pat. No. 4,366,793. This application Feb. 25, 1981, Ser. No. 238,253
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—436 **3 Claims**

1. An improved internal combustion engine having a combustion chamber, means for metering a series of air rations and for metering a corresponding series of fuel rations, means for mixing each one of the fuel rations with its corresponding member of the series of air rations and firing the resulting mixture in the combustion chamber so as to produce a quantum of energy, the resulting series of energy quanta being delivered to a power output shaft, the improvement comprising:

means for automatically reducing the size of members of the series of fuel rations while the size of the corresponding series of air rations is held constant, the average rate of fractional reduction of size of the fuel rations, when averaged over a thousand consecutive members of the series of fuel rations, not exceeding one half per thousand consecutive members of the series of fuel rations;

a decelerometer including a clock means for generating clock signals having at least two different frequencies and a digital counter for counting the clock signals from the clock means,

for determining when a momentary deceleration of the shaft speed exceeds a threshold value, and when the excessive deceleration is immediately followed by a reduction of the excessive deceleration to a small value, the momentary deceleration being measured by counting up from a preset value on the digital counter at a first clock frequency



during a first angular displacement of the shaft and then counting downward on the counter at a lower second clock frequency during a second angular displacement of the shaft, the threshold value for abnormal deceleration being determined at least in part by the frequency difference between the up count and the down count;

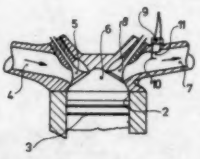
means for automatically increasing the size of succeeding members of the series of fuel rations when the decelerometer determines that the engine has produced a quantum of energy which is abnormally deficient compared to both the immediately preceding and the immediately succeeding members of the series of energy quanta, the single fractional increase in size of the fuel ration not exceeding one fifth when the size of the air ration is unchanged.

4,372,270

METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTIBLE MIXTURE OF AN ENGINE

Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,676
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554988
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—440 **24 Claims**



1. A method for controlling the fuel-air mixture of an internal combustion engine, said engine including combustion chambers, inlet conduits leading to said combustion chambers and exhaust conduits leading from said combustion chambers to the atmosphere, comprising the steps of

placing an ion-current sensor in the exhaust conduit for measuring an ion-current;

generating a nominal value of the ion-current;

comparing the magnitude of the ion-current with the nominal value and generating a signal representing the difference between the measured value of the ion-current and said nominal value; and

periodically integrating a signal derived from the signal representing the difference between the measured value of the ion-current and said nominal value, especially during one working cycle of a piston of the engine, and altering the fuel-air mixture of the engine in dependence on the result of the integration.

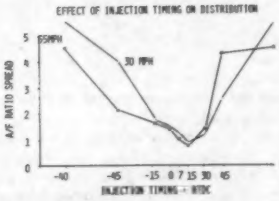
4,372,271
SINGLE POINT INTERMITTENT FLOW FUEL INJECTION

David G. Elpern, Hamtramck, and Gary L. Casey, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 947,910, Oct. 2, 1978, abandoned, which is a division of Ser. No. 778,822, Mar. 17, 1977, Pat. No. 4,132,203. This application Jan. 29, 1981, Ser. No. 229,492

Int. Cl.³ F02M 51/02

U.S. Cl. 123—445 **5 Claims**



1. A fuel management system for an internal combustion engine having a plurality of cylinders and a source of fuel supply, throttle body means mounted on the engine having throat means for delivering fuel to the engine, and means for delivering fuel from the supply to the engine, the engine having an intake valve for each cylinder and a manifold plane interconnecting the throttle body with each cylinder through the intake valve, the system comprising single point injector means disposed contiguous with said throttle body for controlling the injection of fuel into the throat means, means for atomizing the fuel, and means for substantially equalizing the fuel distribution from cylinder-to-cylinder from said single point injector means including means for pulsing said injector means once for each cylinder at a fixed preselected angle of rotation of the engine relative to the opening of the valve corresponding to each cylinder and creating a charge of finely atomized air/fuel, said fixed rotation of the engine being selected to maximize the portion of the air/fuel charge resulting from each injector pulse which is carried to said corresponding cylinder for said opening valve by controlling the time of creation of said air/fuel charge relative to the rotation of the engine and said opening valve.

4,372,272
FUEL DELIVERY SYSTEM WITH FEED AND DRAIN LINE DAMPING

Richard P. Walter, Southfield, and Lael B. Taplin, Union Lake, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 31, 1981, Ser. No. 288,728

Int. Cl.³ F02B 3/00

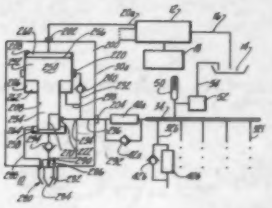
U.S. Cl. 123—467 **17 Claims**

1. A fuel delivery system having metering and injection modes of operation, for injecting fuel into the combustion chambers of a diesel engine, comprising:

a fuel reservoir;

pump means for extracting fuel from said fuel reservoir and selectively applying pressurized fuel to one fuel injector of a plurality of fuel injectors during an injection mode and for selectively depressurizing, during a metering mode, a different one of said plurality of fuel injectors wherein said pressurizing and depressurizing are performed in correspondence with the combustion process within the engine;

a plurality of fuel injectors wherein each fuel injector is adapted to inject fuel within the engine, and has a metering chamber for accepting a determinable quantity of fuel prior to delivery of said determinable quantity of fuel to the respective combustion chambers of the engine in correspondence with the combustion process therein;



a plurality of feedlines interconnecting each of said fuel injectors with said pump means, wherein each feedline is characterized as having a determinable impedance;

pressure source means for establishing a pressure level of fuel intermediate the pressurizing and depressurizing pressure levels applied to said plurality of fuel injectors and for supplying said determinable quantity of fuel to each of said metering chambers; and

drain line means, for carrying fuel between each of said fuel injectors and said pressure source means including a fuel carrying conduit, one associated with each of said fuel injectors, having an impedance equal to the impedance of a corresponding one of said feedlines and, having located therein flow restricting means for restricting the flow therethrough, wherein said flow restricting means has an impedance level to flow nearly equal to the impedance of a corresponding one of said conduits.

4,372,273
QUADRATURE TRIGGER SYSTEM FOR SEQUENTIAL FUEL INJECTION

Peter W. Harper, Agne, France, assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 1, 1981, Ser. No. 249,772

Int. Cl.³ F02D 5/02

U.S. Cl. 123—490 **2 Claims**

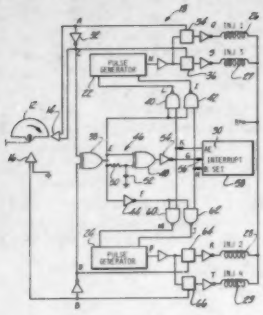
1. In an internal combustion engine having an engine camshaft rotating once for each engine cycle, a quadrature trigger system for a four cylinder sequential fuel injection system having an injector for each cylinder, the system for synchronizing the injections within the first ninety degrees of rotation of the camshaft said trigger system characterized by:

a semicircular cam member adapted for rotation with the camshaft;

two proximity sensors mounted relative to said cam member and positioned ninety degrees apart each responsive to said semicircular cam member for generating an electrical pulse having pulse width time equal to the time said semicircular cam member is in sensing proximity to each of said sensors;

decoding means having two pulse generators each generating sequential injector actuator pulses for two injectors; and

logic means responsive to said sensors and said pulse generators for generating four sequential injector actuator



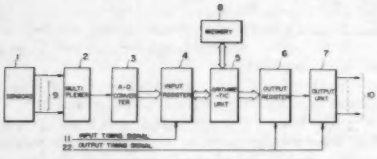
pulses, each pulse logically directed to a particular one of the injectors.

4,372,274

DIGITAL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Sadao Takase, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 2, 1980, Ser. No. 146,015
Claims priority, application Japan, May 4, 1979, 54-54062
Int. Cl.³ F02P *5/04*; F02B *3/00*; H03K *5/13*
U.S. Cl. 123—491 **4 Claims**



4. A method of enhancing operation of a control system for an internal combustion engine which is controlled by a computer means normally operable under control of an operating program for sensing engine operating parameters, processing said operating parameters and generating engine controlling values for controlling said engine, said method comprising the steps of:

(a) storing initial values corresponding to at least one of (1) a preset input value and (2) a preset output value;

(b) detecting an electronic signal indicative of system power-on;

(c) detecting crank revolution timing signals indicative of predetermined amounts of crankshaft revolution;

(d) detecting timing signals generated at predetermined time intervals by a clock of said computer;

(e) in response to at least one of said timing signals, said power-on signal and the absence of any crank revolution signals occurring subsequent to said power-on signal, operating said computer for executing an initialization routine for performing at least one of (1) transferring said preset input value into an input register of said computer for simulating the sensed engine operating parameter normally sensed by sensors of said engine, and subsequently processing said preset input value under control of said operating program to generate at least one of said engine controlled values, and (2) transferring said preset output value into an output register of said computer for simulating at least one of said generated engine controlled values of said operating program; and

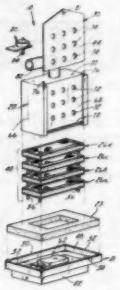
(f) controlling said engine at least prior to receipt of said first crank revolution timing signal occurring subsequent to said power-on signal by at least one of (1) said at least one engine controlling value calculated by said computer from said preset input value and (2) said simulated engine controlling value derived from said preset output value.

4,372,275

FUEL VAPORIZING CARBURETOR

Arlo R. Schmidt, 703 DeClark St., Beaver Dam, Wis. 53916

Filed May 14, 1980, Ser. No. 149,935
Int. Cl.³ F02M *17/28*
U.S. Cl. 123—522 **8 Claims**



1. A liquid fuel vaporizer for an internal combustion engine, said vaporizer comprising;

a housing having an air inlet at one end and an outlet at the other end,

a liquid fuel reservoir in said housing,

a filter assembly in said housing downstream from said reservoir, said filter assembly including a series of filters of progressively smaller size pores located at spaced intervals within said housing, one of said filters being immersed in said fuel reservoir,

means for directing air from said air inlet into said fuel reservoir whereby air passing through said fuel reservoir will pick up fuel and carry it into said filter assembly where the fuel droplets are reduced in size prior to entering the fuel outlet, and

secondary air inlet means in said housing for admitting secondary air into the spaces between said filters.

4,372,276

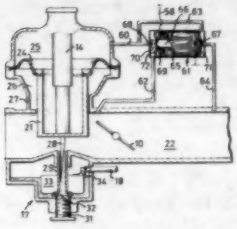
ARRANGEMENT FOR SWITCHING A CARBURETOR IN INTERNAL COMBUSTION ENGINES

Ake A. Bernhardsson, Sollebrunn, and Kent A. Svensson, Vänersborg, both of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 13, 1980, Ser. No. 159,282
Claims priority, application Sweden, Jun. 19, 1979, 7905386
Int. Cl.³ F02M *13/08*
U.S. Cl. 123—525 **4 Claims**

1. An arrangement for switching a carburettor for an internal combustion engine for alternative operation on liquid or gaseous fuel, said carburettor having a through-passage which forms a portion of an inlet duct to the engine, there being provided in said inlet duct a manually operable throttle valve and an air valve located upstream of said throttle valve, said air valve including a piston for variably constricting said through-passage and being provided with a tapered metering needle engaging in a first nozzle for metering liquid fuel to said through-passage, a second nozzle for metering gaseous fuel to said through-passage, the supply of liquid or gaseous fuel through the respective nozzles being regulatable by means of solenoid valves and an electrical circuit for controlling the

solenoid valves, characterized in that at least one solenoid, incorporated in said electrical circuit, is adapted to at least indirectly actuate said piston to assume and retain a position minimally constricting said through-passage, simultaneously as one of said solenoid valves keeps the communication for the supply of gaseous fuel open and another one of said solenoid



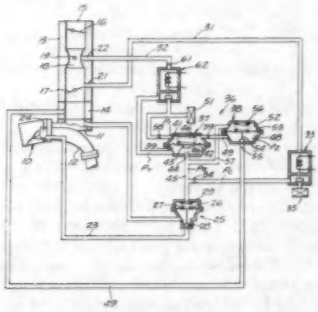
valves keeps a communication for the supply of liquid fuel closed, said arrangement including a chamber and being further characterized in that said solenoid is incorporated in a further solenoid valve which controls communication between said through-passage and said chamber for influencing the position of said piston in the air valve.

4,372,277

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Yutaka Otobe, Niiza, and Michio Kawamoto, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1981, Ser. No. 254,991
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **2 Claims**



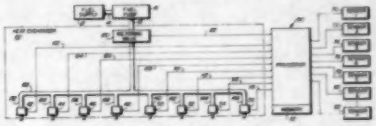
1. An exhaust gas recirculation control system for an internal combustion engine for a vehicle, the engine having an intake passage, an exhaust passage, and a recirculation passageway connecting said exhaust passages, the improvement comprising, in combination: a recirculation control valve in the passageway and having a vacuum pressure responsive actuator, a first conduit connecting the pressure responsive actuator with the intake passage, an air conduit connecting the intake passage downstream from a throttle valve therein to an inlet for atmospheric air, an air valve having a vacuum pressure chamber with a diaphragm and having a valve element secured to the diaphragm for opening or closing said air conduit, said vacuum pressure chamber of said air valve communicating with said pressure responsive actuator, a regulating valve having a vacuum pressure chamber and a valve chamber adjacent to said vacuum pressure chamber with a diaphragm intervening therebetween and a valve element secured to the diaphragm, said vacuum pressure chamber of said regulating valve being interposed in said air conduit upstream from said air valve, a second conduit connecting said valve chamber of said regulating valve with said intake passage upstream from the throttle valve, said valve element of said regulating valve controlling intensity of the vacuum pressure in said vacuum pressure responsive actuator and vacuum pressure in said vacuum pressure chamber of said air valve in response to differential pressure between pressures in both chambers of said regulating valve, and an electric-magnetic valve in said second conduit for opening or closing the second conduit in response to a sensor for an engine operating parameter.

4,372,278

HIGH TEMPERATURE AND HIGH PRESSURE FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Rodney D. Smith, 6550 N. 2nd Dr., Phoenix, Ariz. 85013

Filed Oct. 20, 1980, Ser. No. 199,089
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **9 Claims**



1. Fuel injection apparatus in an internal combustion engine, comprising, in combination:

cylinder means in which fuel is combusted;

a supply of fuel;

manifold means for distributing fuel from the supply of fuel to the cylinder means;

pump means for pressurizing fuel in the manifold means to a pressure of between about 450 psi and about 600 psi to prevent the fuel from vaporizing;

heat exchanger means for heating the pressurized fuel to its vapor point and for maintaining the temperature of the fuel at its vapor point until injected into the cylinder means;

fuel injection means connected to the manifold means and to the cylinder means for receiving the heated and pressurized fuel, and including valve means opening in response to a signal for allowing the heated and pressurized fuel to flow out of the injector means and into the cylinder means in the form of vapor as the result of the pressure and temperature of the fuel;

signal means for providing a signal to the valve means for opening the valve means to meter a flow of heated and pressurized fuel;

a plurality of sensors connected to the engine for monitoring a plurality of engine functions for providing information to the signal means; and

a plurality of predetermined parameters for comparing with the information provided by the plurality of sensors and connected to the signal means for determining the length of time of opening of the valve means and providing the signal to the valve means in accordance with the determined length of time.

4,372,279

HEATED FUEL LINE

Richard W. Parks, Hayward, Calif., assignor to Pacar Inc., Bellevue, Wash.

Filed Nov. 24, 1980, Ser. No. 209,712
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **5 Claims**

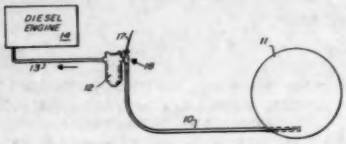
1. A heated fuel line for a liquid-fuel engine having a fuel tank, a fuel line leading from the tank to the engine, and an electrical power supply, comprising:

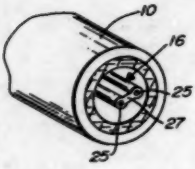
an elongated electricel resistance heating element, compris-

ing a pair of parallel conductive wires spaced apart and covered by a non-metallic resistance sheath in the shape of a flat, thin tape,

said element being inside the fuel line and of substantially less cross sectional area than the fuel line;

a fitting in the fuel line with means connecting the heating element to the exterior of the fuel line; and





external wiring connecting the connecting means and both wires of the heating element in an electrical circuit to the power supply;

whereby the fuel in the fuel line is heated directly and efficiently by the heating element, and solidifying of fuel in the line in extremely low temperatures is avoided.

4,372,280

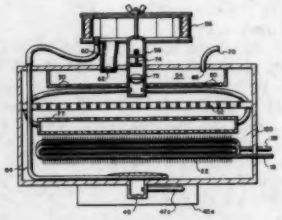
FUEL VAPORIZER

Jerry W. Adams, Colony, Tex., assignor to JEB Energy Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 67,879, Aug. 20, 1979, Pat. No. 4,274,383. This application Apr. 17, 1981, Ser. No. 255,267

Int. Cl.³ F02M *17/22*

U.S. Cl. 123—557 **3 Claims**



1. A fuel vaporizer system comprising:

a vapor compartment for vaporizing liquid fuel;

a heat exchanger disposed within said vapor compartment;

a liquid fuel supply means coupled to said vapor compartment;

input means for introducing ambient air into said vapor compartment, said input means including an air manifold having a plurality of small apertures disposed in the upper surface thereof and a plurality of larger apertures disposed in the lower surface thereof;

a check valve located at said input means for ceasing the introduction of ambient air into said vapor compartment in response to positive pressure therein; and

a vapor mixture compartment located above said vapor compartment having a plurality of apertures located therein to permit entry of vaporized fuel from said vapor compartment, a control valve for selectively controlling the entry of ambient air into said vapor mixture compartment, and vapor outlet means adapted to be connected to an internal combustion engine.

4,372,281

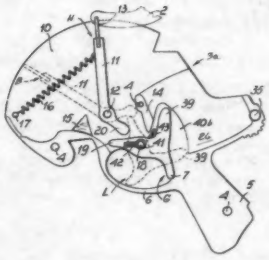
SPRING TYPE BOOMERANG PROJECTING PISTOL

Franco Fiorani, Modena, Italy, assignor to Dulcop International S.p.A., S. Lazzaro Di Savena, Italy

Filed Jul. 21, 1980, Ser. No. 170,415

Int. Cl.³ F41B *7/00*

U.S. Cl. 124—16 **3 Claims**



1. A toy pistol for repeated launching of boomerangs comprising:

a body defining a grip and a launching chamber for the boomerangs,

a magazine formed in said body above said grip, in which a plurality of boomerangs are arranged in side by side relationship, said magazine having a bottom against which the boomerangs are pressed by means of a spring loaded device,

a boomerang projecting lever journalled in said launching chamber and having gripping means at its free end for releasable retention of boomerang and a shaped extension, spring means arranged in said launching chamber and operatively associated to said lever to urge the latter for projection of a boomerang,

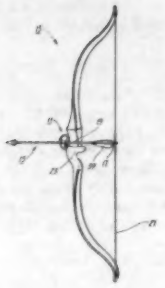
a housing slot formed in said body and communicating with said magazine for receiving the boomerang resting on the bottom of said magazine,

a trigger rotatably supported in said body and having a cam portion in operative engagement with said shaped extension and an ejecting portion adapted to penetrate said magazine, actuation of said trigger causing along a first rotational movement thereof said ejecting portion to enter said magazine for urging the boomerang resting on the bottom of the magazine into said housing slot and said cam portion to engage said extension to rotate said lever from a resting position in a position in which the gripping means grip the urged boomerang at one end thereof, whereas along an additional rotational movement of said trigger said cam portion disengages from said extension thus permitting said lever under the action of said spring means to snap back into said resting position, whereby the gripped boomerang is entrained out of said housing slot and thrown away.

4,372,282
ARCHERY BOW WITH ARROW SUPPORT

Edward Sanders, P.O. Box 585, Laverne, Okla. 73848

Filed Feb. 8, 1980, Ser. No. 119,943
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R 6 Claims



1. An archery bow comprising:

a bow member having a handle disposed at a midportion thereof and an open arrow rest ledge disposed adjacent said handle;

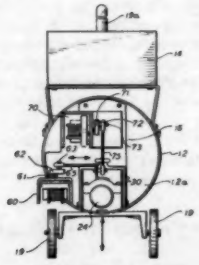
radial support means for radially supporting an arrow in a ready-to-shoot position with respect to said bow member including an exterior frame having an opening for receiving an arrow longitudinally therethrough and at least three flexible arrow support arms extending radially into said opening forming a radial enclosure for radially supporting an arrow in a ready-to-shoot position with respect to said bow member; and

means for removably connecting said radial support means to said bow member such that said archery bow is functional in a conventional manner with said radial support means removed.

4,372,283
BALL SERVING APPARATUS HAVING INDEPENDENTLY OPERATING HORIZONTAL AND VERTICAL FIRING BARREL OSCILLATING MEANS

William J. Balka, Jr., 1120 Prospect St., Westfield, N.J. 07090

Filed May 14, 1981, Ser. No. 263,409
Int. Cl.³ F41F 1/04
U.S. Cl. 124—56 2 Claims

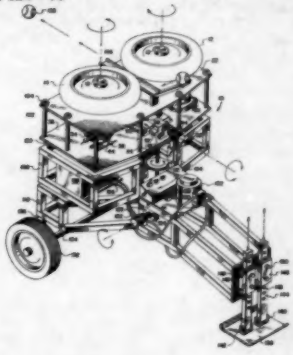


1. In an automatic ball serving apparatus having a ball firing barrel connected by a flexible tube to a compressed air bucket disposed substantially horizontally and including a front end face from which compressed air is fed through said flexible tube into said barrel to fire balls therethrough, the improvement which comprises: a first brace section pivotally mounted to the lower part of said front end face for swinging movement relative to said compressed air bucket about a first axis, a second brace section pivotally mounted on said first brace section and attached to said firing barrel for pivotally mounting said firing barrel on said first brace section for swinging movement relative to said first brace section about a second axis disposed at a generally right angle to said first axis, a first motor mounted on said front end face above said first brace section, a first connector extending from said first motor to said barrel for continuously oscillating said firing barrel about said second axis, and a second motor mounted on said front end face spaced to the side of said first brace section, a second connector extending from said second motor to said first brace section for continuously oscillating said first brace section and thus the firing barrel also, about said first axis, whereby balls may be fired successively through said firing barrel so as to be discharged in random directions both in respect to the height of the served ball and its lateral displacement.

4,372,284
BASEBALL-PITCHING MACHINE

James A. Shannon, 1705 W. Hunt, and B. W. McClure, 1517 Lakewood, both of Sherman, Tex. 75090

Filed Apr. 14, 1980, Ser. No. 139,792
Int. Cl.³ F41B 11/00
U.S. Cl. 124—78 11 Claims



1. A baseball pitching machine comprising a single shunt wound DC motor having a V-belt pulley thereon; a single double backed V-belt; a single spring-loaded variable speed drive pulley; a first pneumatic tire wheel axially attached to such variable drive pulley; a second wheel axially mounted on a non-variable drive pulley; said V-belt connecting said variable drive pulley, DC shunt wound motor, and non-variable drive pulley; a system of idler pulleys connected to the V-belt for rotating said variable drive pulley and non-variable drive pulley in opposite directions; means for varying the tension on the V-belt; securing means for securing the variable and non-variable drive pulleys, motor, and idler pulley system, and tension varying means so that said V-belt runs substantially in a single plane; means for securing said first and second pneumatic tires so that their axes of rotation are always perpendicular to the plane of the V-belt; means for tilting the plane of the V-belt while such plane remains in perpendicular relationship with the axes of rotation of said first and second wheels; means for pivoting the plane defined by the axes of rotation of the first and second wheels; means of adjusting the distance between the axes of rotation of the first and second pneumatic tire wheels comprising an upper plate and a lower plate, a slot in the upper plate and a slot in the lower plate, both slots receiving an axle axially attached to said first pneumatic tire wheel, such that the center lines of the slot in the upper plate and the slot in the lower plate lie in the same plane as the axes of

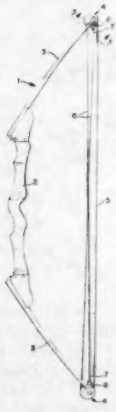
rotation of the first pneumatic tire wheel and the second pneumatic tire wheel, and the width of said slot being slightly greater than the diameter of the axle, two narrow slots adjacent and parallel to each said slots on either side of said slots, two bearings positioned axially according to the axis of rotation of said first pneumatic tire wheel and receiving the axle, wherein one of such bearings is fastened to the upper plate at the said slot in that plate and to the lower plate at the said slot in that plate by means of bolts passing through said narrow slots which may be loosened to allow the bearings to be moved along said slot and the bolts along said narrow slots; means for varying the distance between the axes of rotation of the first and second wheels; means for introducing a ball into the space between the first and second wheels along a path perpendicular to the plane defined by the axes of rotation of the first and second wheels; and the distance between the axes of rotation of the first and second wheels being adjusted so that balls of varying sizes are gripped between the first and second wheels briefly before being ejected from such oppositely rotating wheels.

4,372,285

ADJUSTABLE CABLE END BRACKET FOR COMPOUND BOW

Gary Simonds, Gainesville, Fla., and Arnold D. McKee, Hartford, Ill., assignors to Victor United, Inc., Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,976
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—90 **4 Claims**



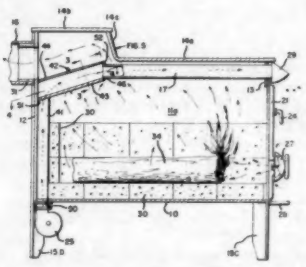
1. In a compound archery bow having wheel assemblies eccentrically mounted upon pivot pins disposed adjacent each of two bow limb tips, a bowstring spanning said two wheel assemblies, a tension cable passing around each said wheel assembly and having a free end provided with an end fixture adjustably attached adjacent and opposite said wheel assembly; the improvement comprising, a cable end attachment bracket mounted upon at least one said pivot pin, said bracket including, separate elongated bow cable plates each having inside faces at least partially overlapping one another and each having oppositely directed outside faces, opposite inner and outer edges on each said plate, of said bow plates provided with mounting means adjacent its outer edge engageable with said pivot pin adjacent one said wheel assembly, said mounting means including a pivot bore extending through said bow plate outside and inside faces, said cable plate having cable end connecting means adjacent said cable plate outer edge receiving one said tension cable end, said cable plate connecting means including a key opening extending through said cable plate outside and inside faces, said key opening receiving the end of said cable end fixture, mating adjustment means on said overlapping inside faces selectively engageable to define the axial length of said bracket between said bow plate mounting means and said cable plate connecting means, releasable retaining means operable to clamp said mating adjustment means together to fixedly maintain said selected bracket axial length and said mating adjustment means comprising a plurality of teeth on said cable and bow plate inside faces adjacent said inner edges and extending transversely of the axial extent of said plates.

4,372,286

WOOD BURNING STOVE

Arthur L. Baker, R.D. #1, Lewisberry, Pa. 17339

Continuation of Ser. No. 949,104, Oct. 6, 1978, Pat. No. 4,258,693. This application Dec. 16, 1980, Ser. No. 216,853
The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **12 Claims**



9. In a stove which includes a fire chamber comprising opposite side walls, top and bottom walls, front and rear walls, draft inlet means located at the front of the fire chamber and a flue opening located in the top rear section of the fire chamber, the improvement which comprises:

an enclosed air chamber within the fire chamber for transferring heat from a fire burning in the fire chamber to air brought into the air chamber from outside the stove, the air chamber comprising;

a lower substantially vertical portion extending upwardly from the bottom wall of the fire chamber and adjacent the rear wall thereof to a point below the flue opening, and

an upper portion joined to and communicating with the lower portion at the upper end of the lower portion and extending upwardly therefrom at an acute angle with the horizontal to a point forward of the flue opening, the upper portion including upper and lower walls at least one of which is in sealing engagement with the opposite side walls of the fire chamber, the forward end of the air chamber being positioned below the top wall of the fire chamber a distance sufficient to allow hot gases from the fire to flow between the air chamber and the top wall of the fire chamber on their way to the flue opening.

4,372,287

WOOD-BURNING STOVE AND METHOD FOR BURNING WOOD

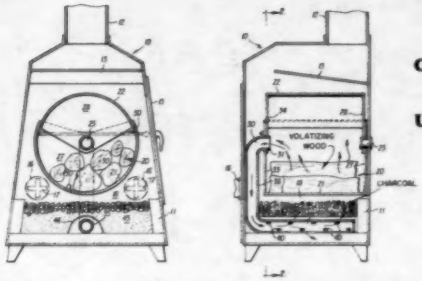
Roy E. Van Der Linden, 3115 Sam's Creek Rd., New Windsor, Md. 21776

Filed Oct. 17, 1980, Ser. No. 198,191
Int. Cl.³ F24B *5/00*; C10B *1/06*
U.S. Cl. 126—79 **4 Claims**

1. A wood-burning stove comprising:

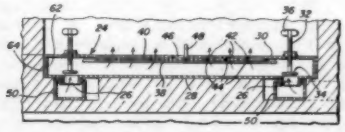
a substantially closed first chamber for containing wood having volatiles to be driven therefrom in the absence of air;

a second chamber interfacing with the first chamber for combustion of the volatiles produced in the first chamber;
means for introducing air into the second chamber;
means for transmitting volatiles from the first chamber to the second chamber upon heating the first chamber by combustion in the second chamber wherein carbon containing residuals remain in the first chamber after the volatiles have been driven from the first chamber, said transmitting means being the only substantial connection between the



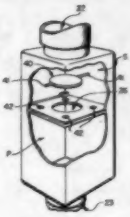
interior of the first chamber and the second chamber during normal operation of the stove, and
means for dumping the carbon-containing residuals remaining in the first chamber after burning wood therein into the second chamber, whereby when the first chamber is again loaded with wood heat, from the carbon-containing residuals helps drive volatiles from the wood, which volatiles are burned in the second chamber along with the carbon-containing residuals.

4,372,288
OUTSIDE COMBUSTION AIR UNIT FOR MASONRY FIREPLACE
James E. Nicholas, 211 W. Hess St., Bushnell, Ill. 61422
Filed Jul. 8, 1980, Ser. No. 166,415
Int. Cl.³ F24B *13/02*
U.S. Cl. 126—143 **3 Claims**



1. In combination with a building having a fireplace opening into one room of the building and with the fireplace having a glass or similar material door operatively associated with the opening thereof in a manner to substantially prevent the entrance of room air into the fireplace, said fireplace including a hearth, an elongated hearth supported hollow housing disposed in said fireplace inwardly of said door and extending across the fireplace opening, said housing including a plurality of outlet openings spaced therealong and including damper means for variably opening and closing said outlet openings, the opposite ends of said housing including air inlet openings and valve structure operatively associated with said inlet openings for variably closing the latter, air inlet duct structures including outlet ends communicated with said inlet openings and inlet ends opening to the exterior of the building in which said fireplace is disposed through different exterior sides of said fireplace, said housing being recessed within said hearth and said inlet openings of said housing opening upwardly through an upper portion of said housing, said housing inlet openings opening downwardly through downwardly projecting tubular inlet nipples supported from the opposite ends of the lower portion of said housing, said valve structures including valve members threadedly supported from said housing upper portion and vertically adjustable downwardly toward and away from the upper ends of said tubular nipples through the upper portion of said housing, said outlet ends of said inlet duct structures underlying said opposite ends of said housing and having upwardly facing openings formed therein downwardly through which said nipples project into said inlet duct structures.

4,372,289
FLUE BOX ASSEMBLY
Craig D. Funke, 14640 Chicago Rd., Dalton, Ill. 60419
Filed May 22, 1980, Ser. No. 149,849
Int. Cl.³ F23L *11/00, 13/00*
U.S. Cl. 126—292 **8 Claims**



1. In a flue box assembly for conserving fuel consumption in conjunction with a heating plant having a housing with an interior diametric opening substantially greater than the exhaust gas inlet to and outlet from the interior of the housing, a damper means having a flue opening diametrically smaller than either the inlet or the outlet apertures to the housing, said damper means being pivotally mounted within said housing to permit movement of said damper means between a closed position overlying said inlet aperture and an open position; the improvement comprising:
at least one bore in said damper means disposed radially outwardly from said flue opening for enhancing the draft of unburned fuel vapors during start up of the heating plant, wherein the combined area of the bore and the flue opening is smaller than the area of the inlet or the outlet to the housing, thereby eliminating stratification of high concentrations of fuel mixture during start up of the heating plant.

4,372,290
GAS BURNER HEAD WITH MEANS FOR EVACUATING TRAPPED WATER CONDENSATE
Charles D. Visos, Manchester, and James M. Ferguson, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Sep. 5, 1980, Ser. No. 184,197
Int. Cl.³ F24H *1/10*
U.S. Cl. 126—355 **1 Claim**

1. In a gas burner head wherein the burner head includes a generally concave circular top portion having a central portion, a peripheral portion, and a corrugated portion therebetween comprising a plurality of circumferentially spaced depressions; wherein the burner head further includes a circular

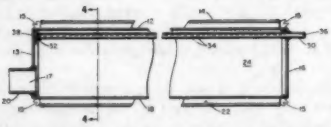
bottom portion having a central portion, a peripheral portion, and a corrugated portion therebetween comprising a plurality of circumferentially spaced depressions; wherein the depressions of the top and bottom portions cooperate to define a plurality of outlet ports for a burner flame; wherein the burner head is positioned below and in axial alignment with the flue of a water heater; and wherein the burner head is susceptible to water dripping into the top portion thereof and accumulating therein, the water being caused by condensation of the water vapor content of the flue gas on the walls of the flue, the improvement comprising means formed by cutting of the peripheral portion of the top portion at one or more of the depressions therein for enabling the accumulated water to flow out of said top portion, and means in the peripheral portion of the bottom portion which cooperate with said means in said peripheral portion of said top portion for preventing said flow of water from adhering to said bottom portion, whereby the burner flame at the outlet ports is not adversely affected by said flow of water, wherein said means formed by cutting of said peripheral portion of said top portion comprises one or more tabs bent downwardly, wherein the diameters of said top portion and said bottom portion are the same, wherein said peripheral portion of said bottom portion comprises a generally flat portion, and wherein said means in said peripheral portion of said bottom portion comprises one or more openings, each said opening being located directly beneath each said tab and spaced therefrom.

4,372,291

SOLAR HEAT EXCHANGER

David M. Schwartz, Washington, D.C.

Filed Nov. 9, 1979, Ser. No. 93,002
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 16 Claims



1. A solar heat exchanger for vaporizing within the exchanger virtually all feed liquid heat transfer medium which enters the exchanger by utilizing solar light energy as the heating source, said solar heat exchanger comprising:

a closed metal boiler tube wherein vaporization of feed liquid entering the exchanger occurs, said metal tube coated with heat absorbent coating and having an inlet opening for admitting the feed liquid into the metal boiler tube and an outlet opening for passing the vaporized product from the metal boiler tube,

a transparent glass tube enclosing the metal tube and forming an annular space between the glass tube and the metal boiler tube, said annular space evacuated to vacuum pressure, and

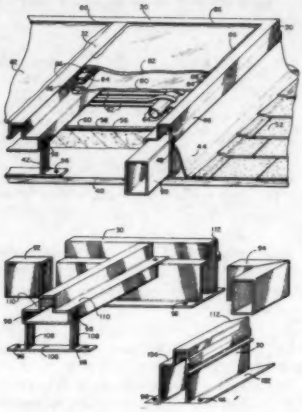
a spray tube of small diameter relative to the diameter of the metal boiler tube, said spray tube located within the metal boiler tube and having a plurality of spray orfices in close proximity to each other placed along the length of the spray tube, one end of said spray tube being in communication with said inlet opening of said metal boiler tube, said feed liquid entering said exchanger at a pressure sufficient to produce a continuous spray of said feed liquid through the spray orifices of said spray tube, said spray continuously impacting against the inside surface of said metal boiler tube to improve the rate of heat transfer to the feed liquid so that virtually all the liquid entering the metal boiler tube is converted to vapor within said metal boiler tube.

4,372,292

METHOD AND APPARATUS FOR CONSTRUCTION OF A SOLAR COLLECTOR

Sterling L. Ort, R.D. #1, Box #14, Lewisberry, Pa. 17339

Filed Apr. 14, 1981, Ser. No. 254,054
Int. Cl.³ F24J *3/02*; E06C *2/38*
U.S. Cl. 126—450 10 Claims



1. A solar collector having a liquid heat transfer fluid carrying means exposable to solar radiation and connectable to a heat transfer fluid circulating system, the collector comprising:

at least one layer of transparent material positioned above an air space over the liquid heat transfer fluid carrying means, for insulating and sealing the heat transfer fluid carrying means from ambient conditions;

a plurality of outer frame members for bearing the transparent material and for enclosing and sealing the heat transfer fluid carrying means from ambient conditions, about its perimeter, each outer frame member having means for attachment to a collector-bearing structure and comprising, in cross-section, at least one inner and at least one outer vertical wall section providing abutment surfaces against lateral movement and at least one upper and at least one lower horizontal section providing abutment surfaces against vertical movement, the at least four abutment surfaces defining an interconnection opening for positively aligning and joining the outer frame members;

a plurality of interconnection members, each dimensioned to be fitted longitudinally into the interconnection openings of adjacent outer frame members, whereby all of the outer frame members may be positively and permanently aligned and interconnected by the interconnection members.

4,372,293

APPARATUS AND METHOD FOR SURGICAL CORRECTION OF PTOTIC BREASTS

Cesar A. Vijil-Rosales, 5642 Indigo, Houston, Tex. 77096

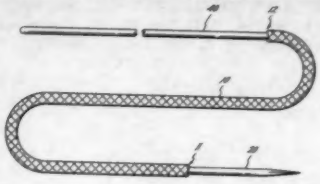
Filed Dec. 24, 1980, Ser. No. 219,670
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R 10 Claims

1. A method of repairing ptosis of the breast and other defects of a mammary gland, comprising:

attaching the lower end of a ribbon of physiologically inert mesh to the tissue of the mammary gland;

conducting the ribbon beneath the surface of the skin upward to a predetermined area of the fascia or the skeletal structure above the mammary, and;

attaching the upper end of the ribbon to the skeletal structure or the fasica above the mammary, the ribbon being sufficiently taut to impede the fall of the breast below a predetermined position.

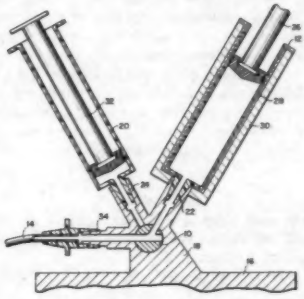


4,372,294

METHOD AND APPARATUS FOR RADIOLABELING RED BLOOD CELLS

Harry W. Strauss, Newton; Ronald J. Callahan, Boston, and Jerry W. Froelich, Woburn, all of Mass., assignors to The Massachusetts General Hospital, Boston, Mass.

Filed Sep. 25, 1980, Ser. No. 190,667
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—1.1 **4 Claims**



1. The process for labeling with technetium-99m red blood cells of a patient en vivo which comprises serially and continuously administering to said patient a non-toxic stannous composition capable of reducing technetium, withdrawing a blood sample from said patient through a catheter containing heparin and into a vial containing technetium-99m as pertechnetate, incubating a mixture of said blood sample and said pertechnetate until substantially all of said pertechnetate is bound to the red blood cells in said sample, filling said catheter with heparin and injecting the incubated sample through said catheter containing heparin into said patient.

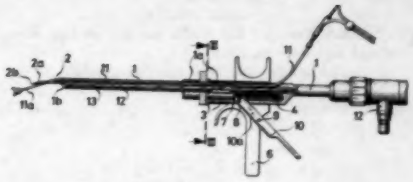
4,372,295

ENDOSCOPES

Helmut Heckele, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,304
Claims priority, application Fed. Rep. of Germany, May 25, 1979, 7915282[U]
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—4 **5 Claims**

1. An endoscope having a hollow shaft receiving a flexible ancillary instrument passed therethrough with the distal end of said instrument projecting from the distal end of said shaft, and means for flexibly displacing said distal end of said instrument at different selective angles, wherein said means comprises two rods which pass through said shaft parallel to the longitudinal axis thereof and are joined together into a U-shape at their distal end, said distal end of said rods being bent over at an angle downwardly away from said axis of said shaft to bear against and force downwardly at an angle the upper side of said distal end of said instrument distally projecting from said endoscope shaft when in position, said rods being connected to a slider in the proximal end of said endoscope shaft, said slider being displaceable parallel to said longitudinal axis of said shaft towards the proximal end against a spring by means of an external handle and which displacement of the slider moves said U-shape distal end of the rods closer to the distal end of said shaft along the upper side of the distal end of said instrument, resulting in the distal end of said instrument outward of the distal end of said shaft acquiring an increased angular setting downward.



4,372,296

TREATMENT OF ACNE AND SKIN DISORDERS AND COMPOSITIONS THEREFOR

Mostafa S. Fahim, 500 Hulen Dr., Columbia, Mo. 65201

Filed Nov. 26, 1980, Ser. No. 210,370
Int. Cl.³ A61H *23/00*
U.S. Cl. 128—24 A **3 Claims**

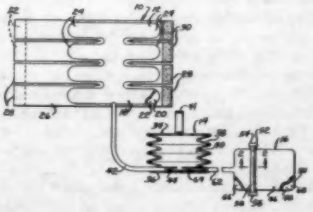
1. A method for treating acne comprising topically administering with ultrasonic vibrations at a frequency between 1000 KHZ and 3000 KHZ and at a power level between 0.5 and 3.0 watts per sq. cm. to acne affected skin an effective amount of a composition comprising from about 1.0 to about 4.0 percent by weight of zinc sulfate and from about 2.0 to about 6.0 percent by weight of ascorbic acid in a pharmaceutical carrier which is an effective coupling agent for ultrasonic vibrations and which does not inactivate the pharmacological activity of the zinc salt or ascorbic acid whereby said composition effectively retards the rate of sebum secretion in the treated area and stimulates the production of collagen.

4,372,297

COMPRESSION DEVICE

Alfred R. Perlin, Highland Park, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 28, 1980, Ser. No. 210,889
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—64 **12 Claims**



1. A compression device, comprising:
a sleeve for placement about a patient's limb, said sleeve having an inflatable chamber;

a pump communicating with said chamber for inflating the chamber;

a bladder having an inflatable cavity communicating directly with the pump; and

means for adjusting the effective volume of said bladder cavity which communicates with said pump.

4,372,298

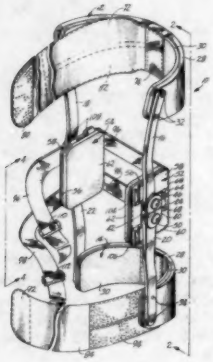
KNEE BRACE

Max Lerman, Beverly Hills, Calif., assignor to U.S. Manufacturing Co., Pasadena, Calif.

Filed Jul. 20, 1981, Ser. No. 285,424

Int. Cl.³ A61F 3/00

U.S. Cl. 128—80 C **16 Claims**



1. A knee brace comprising:

upper and lower limb support members;

means for securing the upper and lower limb support members to the upper and lower legs above and below the knee joint;

a pair of upper support arms extending down from the upper limb support member for extending along opposite sides of the upper leg to remote ends adjacent lateral and medial sides of the knee joint;

a pair of lower support arms extending upwardly from the lower limb support member for extending along opposite sides of the lower leg toward remote ends adjacent lateral and medial sides of the knee joint;

lateral and medial pivot means interconnecting the remote ends of the upper support arms with the remote ends of corresponding lower support arms for providing relative pivotal movement of the upper and lower support arms adjacent the lateral and medial sides of the knee joint, said pivotal movement being about a generally horizontal axis, the lateral and medial pivot means each having a fixed portion adjacent lateral and medial sides of the knee joint so the corresponding upper and lower support arms pivot relative to the fixed portions of the pivot means;

lateral and medial condyle pads for contacting lateral and medial sides of the knee joint; and

lateral and medial hinge means affixed to the lateral and medial condyle pads and hinged to the fixed portions of the lateral and medial pivot means for mounting the condyle pads between the lateral and medial pivot means, so the condyle pads can be placed in direct contact with the lateral and medial sides of the knee joint, the lateral and medial hinge means allowing the lateral and medial condyle pads to each pivot through an angle relative to the fixed portions of the pivot means and about a generally vertical axis toward and away from each other, such pivotal movement of the condyle pads being within the space between the lateral and medial pivot means.

4,372,299

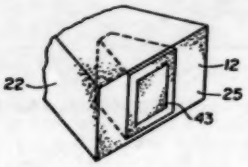
ABDUCTION PILLOW WITH STORAGE CAVITY

Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021

Continuation of Ser. No. 75,498, Sep. 13, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 299,972

Int. Cl.³ A61F 5/00

U.S. Cl. 128—80 A **4 Claims**



1. An improved abduction pillow adapted for use with a patient recovering from medical surgery for immobilizing the patient's legs and hips comprising:

a pillow made from foam having a substantially constant thickness, said pillow comprising a first piece having a substantially triangular shape and a second piece having a substantially truncated triangular shape, fastening means for removably connecting said first piece to said second piece whereby said first piece may be disconnected from said second piece and thereafter said first piece may be reconnected to said second piece, a cavity in said second piece having the shape of said first piece, and a spare first piece inserted within said cavity and being removable therefrom, said spare first piece being removably connectable to said truncated end of said second piece.

4,372,300

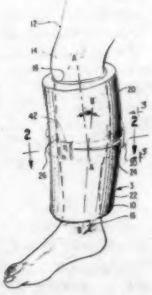
CAST WEDGE

Denis B. Drennan, Evanston; Donald J. Maylahn, Skokie, and Thomas R. Schleicher, Wilmette, all of Ill., assignors to DM Systems, Inc., Evanston, Ill.

Filed May 13, 1981, Ser. No. 263,264

Int. Cl.³ A61F 5/04

U.S. Cl. 128—83 **12 Claims**



1. A wedge for use with a tubular cast for maintaining a space between opposite facing edges formed by a transverse cut in said cast, comprising:

a body formed of molded plastic material having opposite edges spaced a predetermined distance apart for engagement, with said facing cut edges of said cast; and

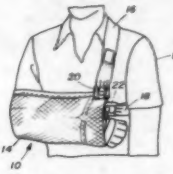
flange means extending normal to said opposite edges and outwardly thereof having a face engageable with an outer surface of said cast adjacent said cut edges for limiting the inward movement of said body into said cast,

said body and said flange means having pairs of substantially coplanar opposite side surfaces normal to said face of said flange means and normal to said opposite edges of said body whereby said body is visible from a side during insertion into a cut in a cast.

4,372,301
ARM SLING

Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Filed Apr. 14, 1981, Ser. No. 254,192
Int. Cl.³ A61F 5/40
U.S. Cl. 128—94 **11 Claims**



1. An arm sling for a person comprising a sling trough of a predetermined unfolded length for supporting a forearm, said sling trough having first and second ends, said first end closed for allowing the elbow of the arm to abut the closed end, said trough being constructed of flexible material for allowing the second end to be folded towards the first end for shortening the length of said sling trough for providing a sling of a desired length;

a support strap secured to said first end, said support strap of sufficient length for traversing the back and the shoulder opposite the arm which is in the sling and extend to the top portion of said sling trough adjacent the second end of said sling trough;

fastener means for securing said support strap to said sling trough adjacent the second end of said sling trough including a first member having a first aperture therein for allowing said support strap to be passed therethrough, a second member hinged to said first member, said second member having a first aperture for allowing said support strap to be passed therethrough and;

means for securing said first and second members in superimposed relationship including at least one pin means extending from said first member, said second member having a hole complimentary with said pin means, said pin means engagable in a mating force fit relationship with said hole when said first and second members are superimposed and said pin means is inserted in said hole.

4,372,302
INSTRUMENT FOR RETRIEVAL OF RETRACTED THREADS OF INTRAUTERINE CONTRACEPTIVE DEVICES

Mats Akerlund, Lund, Sweden, assignor to AB Myometricon, Sweden

Filed Apr. 6, 1981, Ser. No. 250,927
Claims priority, application Sweden, Apr. 9, 1980, 8002692
Int. Cl.³ A61F 5/46
U.S. Cl. 128—130 **4 Claims**

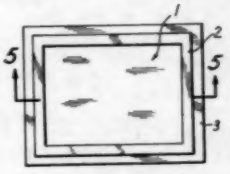
1. An instrument for retrieval of retracted threads of an intrauterine device within a uterus, comprising a relatively stiff handle and a flexible distal part integral therewith, said distal part having a rounded cross-section and being provided with a plurality of notches spaced along its length for gripping the retracted threads during insertion and turning of the instrument within the uterus, wherein the improvement comprises that the distal part is curved so as to form a concave surface

and that the notches are provided on said concave surface of said curved distal part.

4,372,303
BANDAGE FRAME AND METHOD

Frederic Grossmann, Lake Forest, Ill., and Larry A. Sims, Hermosa Beach, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 11, 1980, Ser. No. 186,351
Int. Cl.³ A61F 13/00
U.S. Cl. 128—132 D **28 Claims**



1. A system for bandaging a patient comprising:

a flexible bandage having a backing with an adhesive on a surface thereof for applying to a patient; and

a frame means which is substantially less flexible than the bandage and is attachable to the backing thereof for maintaining said bandage in a generally flat configuration and for controlling wrinkling during handling and application of the bandage to the patient when attached thereto;

whereby the bandage may resume its flexible nature after application to the patient and removal of the frame means, so as not to interfere with the flexible functioning of the bandage on the patient's anatomy.

4,372,304
FLOW CONTROL SYSTEM AND RESTRICTOR FOR USE THEREIN

Emik A. Avakian, Springfield, Mass., and Souren Avakian, Westport, Conn., assignors to Centaur Sciences, Inc., Stamford, Conn.

Filed Oct. 15, 1980, Ser. No. 197,272
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 E **22 Claims**

1. A control for regulating the flow of a liquid through a compressible tube, said control operating in cooperation with a drop sensor which provides output signals commensurate with

the flow of fluid from a reservoir into the tube, said control comprising:

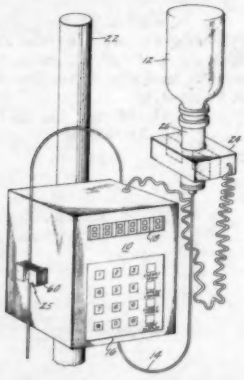
restrictor means for applying a variable compressive force to a tube through which the flow is to be regulated, said restrictor means including:

adapter means, said adapter means having a first passage extending therethrough, said first passage being sized and shaped to receive the tube, said adapter means further defining a second passage which is transverse to and intersects said first passage, said second passage extending from a first side of said adapter means to said first passage;

plunger means, said plunger means having a housing which defines an internal chamber, said plunger means including a plunger movable longitudinally within said chamber, said plunger having a portion which extends outwardly through the first wall of said housing, said housing further defining a holder on the exterior of said first wall, said holder receiving and supporting said adapter means with said first side of said adapter means facing said first wall of said plunger means housing and with said plunger in registration with said adapter means second passage;

motor means, said motor means having a rotatable output shaft; and

means coupling said motor means output shaft to said plunger means plunger, said coupling means extending



into said plunger means housing defined chamber and converting the motor means output shaft rotory motion to longitudinal motion of said plunger;

computer means, said computer means including a program memory and a scratchpad memory, said computer means having a stored program comprising instructions for producing output signals commensurate with flow rate errors and volume yet to be delivered through the tube;

keyboard means for generating command signals and data signals commensurate with a desired flow rate and quantity, said keyboard means being connected to said computer means whereby the generated command and data signals may be supplied to said computer means;

means delivering the drop sensor output signals to said computer means whereby said computer means may compare actual and desired flow rates and generate first error signals as a result of said comparison and whereby said computer means may determine the volume of fluid delivered through the tube and compare the delivered volume with the desired volume and generate second error signals when the total desired volume has been delivered through the tube; and

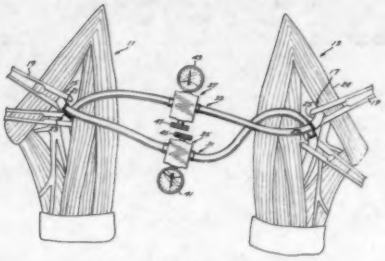
means applying said computer means generated error signals to said restrictor means motor means whereby the tube will be compressed to a degree commensurate with the desired flow rate in response to the said first error signals and will be compressed to a point where flow is prevented in response to the said second error signals.

4,372,305

METHOD OF TREATING DISEASED ORGAN

Harold W. Fogle, 2866 Crownview Dr., Rancho Palos Verdes, Calif. 90274

Filed Jan. 2, 1981, Ser. No. 222,251
Int. Cl.³ A61M *1/03*
U.S. Cl. 128—214 B **15 Claims**



1. A method of treating a diseased organ or organ system of a patient, comprising the following steps:

establishing the blood type of said diseased patient;

selecting a healthy host having blood which is the same type as that of said patient and which matches with that of said patient;

making surgical incisions to expose major arteries of said host and patient;

surgically opening said arteries;

selecting first and second tubes for accomodating substantially complete blood flow between said arteries;

connecting said first tube between the proximal end of such host artery and the distal end of such patient artery;

connecting said second tube between the distal end of such host artery and the proximal end of such patient artery;

maintaining substantially equal rates of continuous blood flow from said proximal end of such host artery, through said first tube, to said distal end of such patient artery and from said proximal end of such patient artery to said distal end of such host artery to establish, for a selected period of time, flow of a homogeneous mixture of host blood with patient blood in the body of said patient to communicate said homogeneous mixture to said diseased organ or organ system;

removing said tubes;

closing said openings in said respective arteries;

closing said incisions whereby said homogeneous flow of blood of the host and patient is communicated to the cells of said diseased organ or organ system for treatment thereof for said period of time.

4,372,306

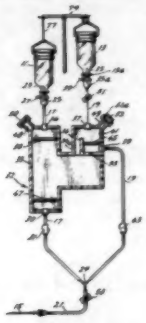
EQUIPMENT SETS HAVING A COMBINED AIR BARRIER AND LIQUID SEQUENCING DEVICE FOR THE SEQUENTIAL ADMINISTRATION OF MEDICAL LIQUIDS AT DUAL FLOW RATES

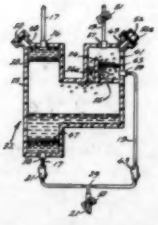
Joseph N. Genese, Waukegan, and Andrew J. Muetterties, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 16,461, Feb. 28, 1979, Pat. No. 4,256,104, Ser. No. 157,922, Jun. 9, 1980, Pat. No. 4,324,238, and Ser. No. 167,948, Jul. 14, 1980, Pat. No. 4,316,460. This application Jan. 26, 1981, Ser. No. 228,632
Int. Cl.³ A61M *5/14*
U.S. Cl. 128—214 G **11 Claims**

1. A gravitational flow system for the sequential administration of medical liquids to a patient comprising:

a primary container suspended in space for containing a primary medical liquid;
a primary tube having its distal end in fluid communication with said primary container;
a secondary container suspended in space at a height greater than that of said primary container for containing a secondary medical liquid;
a secondary tube having its distal end in fluid communication with said secondary container;
a common tube having its distal end in fluid communication with the proximal ends of said primary and secondary tubes and its proximal end open for the flow of liquid therethrough to form a primary liquid path comprising said primary tube and said common tube and a secondary liquid flow path comprising said secondary tube and said common tube;
secondary flow control means in said secondary liquid flow path for adjusting the flow rate of said secondary liquid therethrough;
primary flow control means on said primary tube for adjusting the flow of said primary liquid through said primary liquid





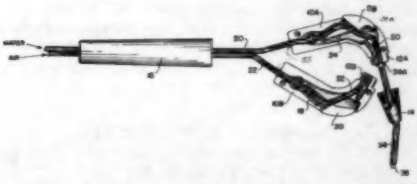
flow path at a rate independent of the flow rate of said secondary liquid through said secondary liquid flow path;
a combined air barrier and liquid sequencing valve interposed in said primary and secondary flow paths which allows primary liquid to flow from said primary container whenever the height of said primary liquid is greater than or equal to the height of said secondary liquid in said system and which prevents primary liquid from flowing from said primary container whenever the height of said primary liquid is less than the height of said secondary liquid in said system;
said combined air barrier and liquid sequencing valve comprising a housing divided into two or more parallel chambers, at the top thereof a first chamber in said housing having an inlet port incorporated therein for the passage of primary liquid into said first chamber, said inlet port having a hydrophilic membrane incorporated therein and covered thereby, and an outlet port incorporated therein for the passage of liquid from said first chamber, said outlet port from said first chamber including a hydrophilic membrane incorporated therein and covered thereby for preventing the passage of air from said first chamber through said outlet port when said hydrophilic membrane is moistened;
a second chamber in said housing having an inlet port to said second chamber at the top thereof for the admission of secondary liquid therein and an outlet port from said second chamber for the passage of secondary liquid therefrom, said outlet port from said second chamber including a second hydrophilic membrane incorporated therein for preventing the passage of air therethrough; and
an air capturing pocket proximate said hydrophilic membrane covering said inlet port to said first chamber, said air capturing pocket comprising the area beneath said hydrophilic membrane covering said inlet port to said first chamber, the sides of said air capturing pocket being defined by the side walls of said first chamber proximate the top of said first chamber, said air capturing pocket being constructed and arranged for the reception of residual air within said first chamber proximate said hydrophilic membrane when said secondary liquid is dispensed into said second chamber whereby the flow of said primary liquid is interrupted for so long as the pressure of said secondary liquid is greater than that of said primary liquid.

4,372,307

PINCH VALVE SYRINGE

Frank A. Betush, Carson, Calif., assignor to Progressive Machine Products, Inc., Carson, Calif.

Filed Jul. 6, 1981, Ser. No. 280,307
Int. Cl.³ A61M 3/00
U.S. Cl. 128—224 **4 Claims**



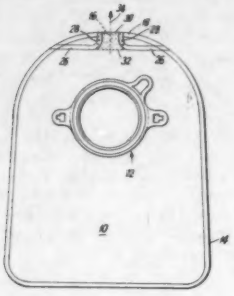
1. A unit for controlling the flow of a fluid including: a body having first and second longitudinal sections; a first elongated resilient strip mounted in the first section of said body and bent back on itself to define a first pinch area; a first resilient tube extending through the first resilient strip and across said first pinch area to be pinched by said first resilient strip; a second elongated resilient strip mounted in the second section of said body and bent back on itself to define a second pinch area; a second resilient tube extending through the second resilient strip and across the second pinch area to be pinched by said second resilient strip; a nozzle mounted on one end of said body and including a coaxial rigid tube; with one end of said first resilient tube being fitted over one end of said rigid tube; and a nut threaded to said one end of said body in coaxial relationship with said nozzle to hold the first and second longitudinal sections together and to cause said sections to clamp and seal the first resilient tube to said one end of said rigid tube; each of said resilient strips having a free end; first and second actuating buttons respectively formed on the free ends of said resilient strips; the two sections of said body also being formed to clamp and seal the second resilient tube against the end of said nozzle when the nut is tightened, to enable the second resilient tube to emit fluid into the annular portion of said nozzle surrounding said rigid tube.

4,372,308

OSTOMY BAG INCLUDING FILTER MEANS

Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants Ltd., London, England

Filed Jul. 10, 1978, Ser. No. 923,127
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 **6 Claims**



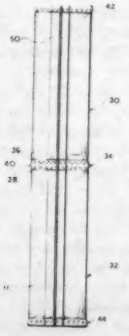
1. An ostomy bag formed by a front wall and a rear wall both of plastics material welded together around their periphery except at a portion of one edge which is at the top of the bag when it is in normal use, filtering means comprising a flat hollow housing the interior of which is provided with filtering material, said housing is formed from synthetic plastics material and is a thin substantially rectangular block whose long sides intersect at both ends of said block to form tapers when said block is viewed in section parallel to the gas path therethrough, said housing having a plurality of holes therethrough leading from the interior to the exterior of said bag, said bag walls being welded to the long sides of said housing so as to form a gas tight seal at the top edge of said bag, and said rear bag wall having an opening adapted to receive the stoma of the user.

4,372,309

MOISTURE ABSORBENT PAD

George B. Fowler, Worcester, England, assignor to Humanicare International Inc., New Brunswick, N.J.

Filed Nov. 10, 1980, Ser. No. 205,720
Claims priority, application United Kingdom, Jul. 19, 1980, 8023685
Int. Cl.³ A61F 13/16
U.S. Cl. 128—284 **11 Claims**



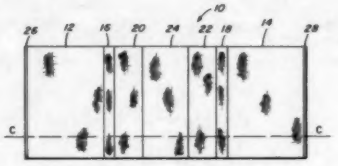
1. A pad of the type adapted to be situated in an incontinence garment or the like, said pad comprising first and second moisture absorbent parts and means for flexibly connecting said parts end-to-end, said connecting means being adapted to permit alignment of the parts in substantially face-to-face relation and comprising a substantially non-moisture absorbent graspable portion, said portion being accessible when said parts are in face-to-face relation and adapted to facilitate removal of the pad from a garment without substantial contact with said moisture absorbent parts.

4,372,310

DIAPER WITH BLENDED YARNS

Timothy L. Sergeant, Seneca, S.C., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 30, 1981, Ser. No. 288,637
Int. Cl.³ A41B 13/02
U.S. Cl. 128—284 **7 Claims**



1. A multi-paneled diaper of zoned construction, said diaper containing at least one panel comprising absorbent filling yarns and warp yarns consisting of a blend of hydrophobic fibers and hydrophilic fibers.

4,372,311

DISPOSABLE ARTICLES COATED WITH DEGRADABLE WATER INSOLUBLE POLYMERS

James E. Potts, Bernards Township, Morris County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 12, 1980, Ser. No. 186,429
Int. Cl.³ A61L 15/00; A61F 13/16; B32B 23/08
U.S. Cl. 128—287 **22 Claims**

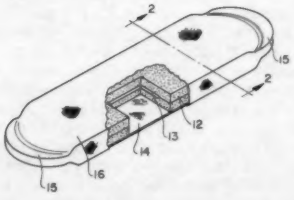
12. A disposable article containing a poly(ethylene oxide) polymer, a surface of the article containing such polymer coated with a degradable water-insoluble polymer.

4,372,312

ABSORBENT PAD INCLUDING A MICROFIBROUS WEB

Eleanor J. Fendler, and Leo J. Bernardin, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 26, 1981, Ser. No. 266,795
Int. Cl.³ A61F 13/16
U.S. Cl. 128—290 R **10 Claims**



1. An absorbent pad containing a nonwoven thermoplastic surfactant-treated filamentary microfibrous web, a fluid pervious cover and an absorbent component between said baffle and said cover, said microfibrous web forming at least part of said absorbent component.

4,372,313

BODY DRAINAGE RECEPTACLE WITH ANTI-SEPTIC CATHETER CONTACT SURFACE IN RECEIVING POCKET

Frank K. Villari, Oak Park, and James P. Cianci, Cary, both of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 139,301, Apr. 11, 1980, Pat. No. 4,333,480. This application Aug. 17, 1981, Ser. No. 293,544

Int. Cl.³ A61F 5/44

U.S. Cl. 128—295 **7 Claims**

1. A urine receptacle, comprising:

a container having a chamber for collection of urine, and a pocket on an outer surface of the container, said pocket having an open end;

a tubular section having an inner end attached to a lower portion of the container and communicating with said chamber, and an outer end; and

an elongated projection means extending from the container and secured in said pocket and being removably receivable in a lumen of the tubular section in said outer end in a storage position of the tubular section in said pocket, said projection means having means for contacting an inner surface of the tubular section and for retaining an antimicrobial agent.

4,372,314

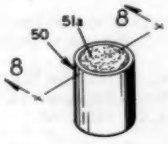
DENTAL SPONGE

W. Henry Wall, 2300 Henderson Mill Rd., Atlanta, Ga. 30345

Filed Sep. 15, 1980, Ser. No. 186,903

Int. Cl.³ A61F 13/00

U.S. Cl. 128—296 **3 Claims**



1. A dental sponge for controlling bleeding from a wound in the mouth and preventing saliva from contacting said wound comprising a cylindrical absorbent member including a hemostatic agent, and a saliva-resistant plastic film encircling the cylindrical surface of said absorbent member, said absorbent member being exposed at at its ends.

4,372,315

IMPEDANCE SENSING EPILATOR

Julius Shapiro, Reading, Pa., and Andrew Eliason, Falmouth, Mass., assignors to Hair Free Centers, Reading, Pa.

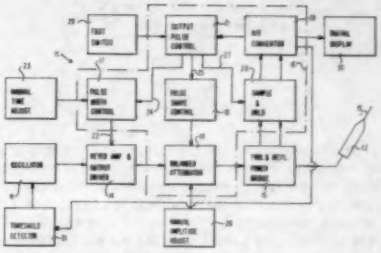
Filed Jul. 3, 1980, Ser. No. 165,669

Int. Cl.³ A61B 17/41

U.S. Cl. 128—303.18 **9 Claims**

1. In an epilator of the type which includes RF generator means, timing circuit means linked to said generator means for gating the output of said generator means into a series of RF energy pulses and probe means which receives the RF energy pulses, said probe means having a tip including a needle adapted to be inserted into a hair follicle of a subject undergoing epilation, the improvement comprising:

(a) sensing means, operative during the initial portion of a given pulse of RF energy, including a forward and reflected power bridge, for sensing the impedance actually perceived by the probe means tip, said bridge generating a control signal which is proportional to said sensed impedance; and,



(b) control means, operative during the balance of said pulse, for automatically adjusting at least one pulse parameter, independently selected from the group consisting of duration and amplitude, responsive to said control signal;

whereby the amount of energy absorbed by the subject via the needle has a value per pulse which is adjusted around a preset value as a function of sensed impedance.

4,372,316

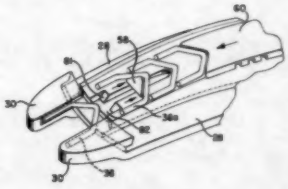
SURGICAL DEVICE

Joseph W. Blake, III, R.R. #2, Box 106, Kitchewan Rd., South Salem, N.Y. 10590, and Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Continuation of Ser. No. 63,268, Aug. 2, 1979, Pat. No. 4,296,751. This application Oct. 24, 1980, Ser. No. 200,407

Int. Cl.³ A61B 17/12

U.S. Cl. 128—325 **10 Claims**



7. A cartridge for use with a surgical device, particularly for use with hemostatic forceps, comprising

a housing having a track provided with an outlet;

means for advancing a string of surgical clips in direction towards said outlet so that the respectively leading clips of the string are sequentially discharged from the outlet to become cinched by jaws of the surgical device;

means for retracting the clips located upstream of the respective leading clip counter to said direction and away from said outlet prior to cinching of the discharged leading clip, so as to avoid interference by the upstream clips with such cinching; and

means maintaining said housing stationary while said clips are being retracted.

4,372,317

METHOD OF INSTALLING A SCALP ANCHOR FOR A HAIRPIECE

Jack Baumann, Los Angeles, Calif., assignor to Look International Enterprises, Inc., San Francisco, Calif.

Division of Ser. No. 625,383, Oct. 24, 1975. This application Nov. 22, 1976, Ser. No. 744,151
Int. Cl.³ A61B 17/00
U.S. Cl. 128—330 11 Claims

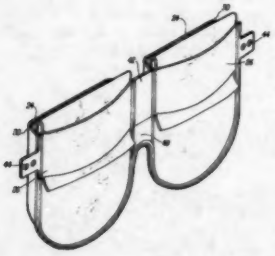
1. A method of forming anchorage means on the scalp to enable removable installation of a hairpiece, said method comprising forming a pair of spaced incisions in the scalp, removing from another surface of the body at least one sheet of skin, transplanting and inserting said sheet of skin within the scalp with the normally outwardly directed surface of said sheet of skin directed inwardly and away from the adjacent scalp tissue which said sheet of skin overlies, so that said sheet of skin substantially defines an area extending between said incisions, thereafter leaving said sheet of skin in such position until it merges with the adjacent scalp tissue to form an integral tunnel open at its opposite ends and throughout its entire length, said tunnel extending continuously between said incisions and being adapted to removably receive a scalp anchor for attachment of a hairpiece to said scalp anchor.

4,372,318

THERMAL TREATMENT DEVICE

Eric Viesturs, 680B Heritage Village, and Gundar Viesturs, Oakhill Dr., both of Southbury, Conn. 06488

Filed Nov. 4, 1980, Ser. No. 203,988
Int. Cl.³ A61F 7/00
U.S. Cl. 128—403 1 Claim



1. A device used to overlie the eyes and nose of patient receiving thermal treatment, said device comprising:

first and second like thin flexible vertically elongated hollow interior members adapted to receive hot or cold material, each member having oppositely disposed front and rear surfaces, top and bottom edges and oppositely disposed side edges defining said interior, the front surface of each member having a slit communicating with each respective interior of the member to enable insertion or removal of hot or cold material into said interior of each member, each slit extending between the side edges of its corresponding front member adjacent but below the top edge of each front member;

a thin vertically elongated flexible central element having oppositely disposed front and rear surfaces and itself disposed between the first and second members, said element having first and second oppositely disposed side edges, each of the first and second side edges of the element being connected to an adjacent side edge of a corresponding one of said first and second members; and

a horizontal elongated flexible strip extending across the front surfaces of said first and second members and said element between the top and bottom edges of said first and second members, the strip having a top edge disposed below the slits of the first and second members, said strip being secured to each member in spaced apart discrete positions adjacent the side edges of each front member and being otherwise spaced from the front surface of each member, each member having a top portion which is disposed above the top edge of the strip and which can be folded upon the remaining portion of the member and positioned between the strip and the front surface of the member to seal said slit, each top portion when folded having a horizontal line of fold coincident with the top edge of said strip;

first and second thin flexible sheets, each sheet being disposed adjacent the rear surface of the corresponding member and sealed thereto along the bottom edge and along those parts of the side edges which are disposed below the top edge of the strip, the top edge of each sheet being aligned with the top edge of the strip, thus forming a pocket whereby each of the first and second members has a corresponding pocket; and

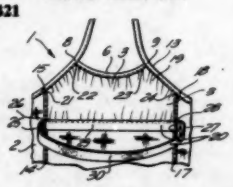
first and second flexible cushioning layers having thermal delay characteristics, each of the layers being removably disposed in the pocket of the corresponding one of said members.

4,372,319

LOW FREQUENCY THERAPEUTIC INSTRUMENT

Tsutomu Ichinomiya; Mamoru Hosoe; Masayoshi Nagayama; Hirotaka Chouss, and Rokusaburo Kimura, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP80/00130, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO80/02803, PCT Pub. Date Dec. 24, 1980
PCT Filed Jun. 13, 1980, Ser. No. 237,126
Claims priority, application Japan, Jun. 15, 1979, 54-75934
Int. Cl.³ A61N 1/36
U.S. Cl. 128—421 4 Claims

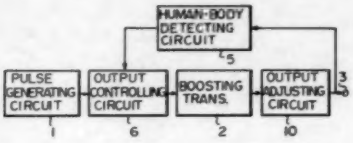


1. Low frequency therapeutic apparatus for applying low frequency pulses to a human body comprising pulse generating means for producing a low frequency pulse output, control means for controlling said pulse output in response to a control signal such that a controlled pulse output is produced, terminal means connected to said control means for applying said controlled pulse output to a human body, human body detecting means responsive to contact of said terminal means with a human body for automatically producing said control signal such that the amplitude of said controlled pulse output is gradually increased from a low value to a predetermined operating value.

4,372,320
ARTICLE OF CLOTHING HAVING BUILT-IN BUST SUPPORT

Philip Silber, 3 Guyer Rd., Westport, Conn. 06880

Filed Aug. 27, 1981, Ser. No. 296,705
Int. Cl.³ A41C 3/08; A41B 5/00
U.S. Cl. 128—455 5 Claims



1. An article of clothing having built-in bust support and being capable of being worn by a person comprising

an outer garment which is capable of extending from the shoulders of said person to the waist of said person,

said outer garment having a right side longitudinal seam line and a left side longitudinal seam line,

a right side attachment zone located within and along said right side longitudinal seam line,

a left side attachment zone located within and along said left side longitudinal seam line,

an inner garment inside of said outer garment and having an upper part and a lower part,

said upper part of said inner garment being capable of extending from above the bust of said person to below the bust of said person and along the inner front side of said outer garment,

means for securely attaching said upper part of said inner garment to said outer garment along the front side of said outer garment,

means for securely attaching said upper part of said inner garment to said outer garment, along the right side longitudinal seam line of said outer garment, from above said right side attachment zone, down to and within, said right side attachment zone,

means for securely attaching said upper part of said inner garment to said outer garment along the left side longitudinal seam line of said outer garment, from above said left side attachment zone, down to and within, said left side attachment zone,

said lower part of said inner garment extending circumferentially completely around the inside of said outer garment and said lower part being capable of being placed below the bust of said person,

said lower part of said inner garment comprising a front section and a rear section,

means for securely attaching said front section of said lower part of said inner garment to the bottom edge of said upper part of said inner garment,

means for securely attaching said front section of said lower part of said inner garment at said right side attachment zone to the right side longitudinal seam line of said outer garment,

means for securely attaching said front section of said lower part of said inner garment at said left side attachment zone to the left side longitudinal seam line of said outer garment,

between said right side attachment zone and said left side attachment zone said front section of said lower part of said inner garment is continuously attached to said bottom edge of said upper part of said inner garment, and between said attachment zones said front section of said lower part of said inner garment is not attached to said outer garment, and between said attachment zones said bottom edge of said upper part is also not attached to said outer garment,

whereby there is a region in which said upper part of said inner garment and the front side of said outer garment are unconnected.

4,372,321
MOLDED REINFORCED BREAST CUP AND METHOD FOR MAKING SAME

Earl Robinson, Marietta, Ga., assignor to The Lovable Company, Norcross, Ga.

Filed Apr. 18, 1980, Ser. No. 141,329
Int. Cl.³ A41C 3/00
U.S. Cl. 128—463 8 Claims

1. A molded breast cup for use in brassieres and other garments, said breast cup comprising

(a) an outer layer of fabric having a bottom edge,

(b) an inner layer of fabric having a bottom edge,

(c) an intermediate reinforcing layer of fabric having a bottom edge,

(d) said intermediate layer being sandwiched between said outer and inner layers with the three bottom edges in juxtaposed relation, the height of said intermediate layer being smaller than that of said outer and inner layers,

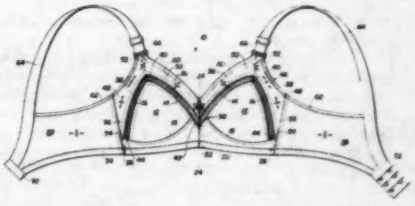
(e) fusable means being provided on some of said layers,

(f) said three layers being molded between heated male and female molding members to form a unitary molded breast cup wherein the intermediate layer provides reinforcement at the central bottom part of the cup.

4,372,322
BRASSIERE

Harold Stern, Wyckoff, N.J., and Elisabeth Suleiman, Newark, Del., assignors to International Playtex, Inc., Stamford, Conn.

Filed Jun. 2, 1981, Ser. No. 269,916
Int. Cl.³ A41C 3/00
U.S. Cl. 128—491 19 Claims



1. A brassiere comprising:

two breast receiving cups each having an inner edge, an outer edge, and a bottom edge;

cup framing means peripherally extending about said cups;

body encircling means affixed laterally outward of said framing means;

shoulder straps extending upward of said cup framing means;

a non-stretchable bottom portion of said cup framing means being connected directly to said bottom edge of a respective cup, extending laterally beyond the inner and outer

edges of said cups, and secured at its outer edge to a respective body encircling means;

a unitary inner and outer panel of said cup framing means of multi-directional stretchable material for each cup extending along the inner and outer edge of said cups; and

transition means interconnecting said unitary inner and outer panel and the inner and outer edge of said cup for providing a transition between the cup and the multi-directional stretchable inner and outer panel.

4,372,323

ULTRASONIC DIAGNOSING APPARATUS

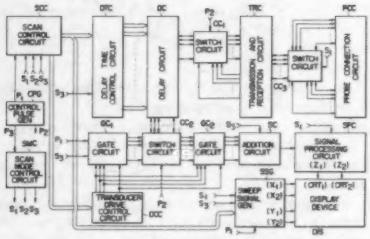
Yasuhiko Takemura, Nishinasuno; Takahisa Okazaki, Otawara, and Akira Imai, Urawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 18, 1980, Ser. No. 170,178

Claims priority, application Japan, Jul. 20, 1979, 54-91675

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **6 Claims**



1. An ultrasonic diagnosing apparatus comprising:

probe means including a plurality of ultrasonic transducers and means for actuating said transducers to produce ultrasonic scanning beams and to receive the reflections thereof from a subject under examination;

scan mode selection means for selectively producing either a first or a second scan mode control signal representing either a linear scan mode or a sector scan mode, respectively;

scanning control means including means for delaying driving timing signals fed to said transducers and the echo signals received thereby, said scanning control means being controlled by said first scan mode control signal to set said delay means to produce a series of parallel scanning beams for linear scanning and being controlled by said second scan mode control signal to set said delay means to produce a series of divergent scanning beams for sector scanning;

signal processing means responsive to said mode control signals for transforming the echo signals received by said transducers into video signals in accordance with either a linear or a sector scan processing algorithm; and

display means for displaying at least one tomogram according to said video signals produced by said signal processing means.

4,372,324

ANALOG PEAK VOLTAGE DETECTOR IN A DEFIBRILLATOR

Martin G. Rockwell, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 17, 1981, Ser. No. 293,649

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—695 **6 Claims**

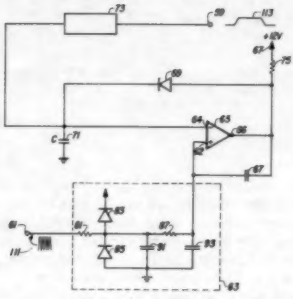
1. An apparatus for detecting the maximum current conducted through a patient during defibrillation comprising:

current generating means for generating a substantially constant current;

switching means coupled to the current generating means for switching the current generating means on and off;

capacitive storage means coupled to an output of the current generating means for storing a held voltage and increasing the held voltage at a substantially constant rate while the current generating means is turned on;

transforming means coupled to the patient for transforming the current through the patient to a proportional voltage; and



voltage comparison means coupled to the capacitive storage means, the transforming means, and the switching means, for causing the switching means to turn the current generating means on when the held voltage is less than said proportional voltage and off when the held voltage is greater than said proportional voltage, thereby increasing the held voltage until it is equal to the maximum value of the proportional voltage thereby indicating the maximum current conducted through the patient.

4,372,325

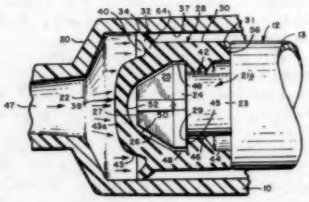
METHOD FOR TAKING A BLOOD SAMPLE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Division of Ser. No. 870,118, Jan. 17, 1978, which is a continuation-in-part of Ser. No. 714,644, Aug. 16, 1976, abandoned. This application Nov. 2, 1981, Ser. No. 317,307

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—763 **1 Claim**



1. A method for taking a sample of blood using a disposable syringe assembly particularly suited because of the low force requirement for the operation thereof to be used for obtaining a blood sample from a patient wherein said syringe comprises a barrel having a cylindrical inner wall and a plunger comprising a plunger stem and a compressible, elastomeric, generally cylindrical plunger tip of lesser diameter than the inner wall of said barrel, said plunger tip having an integral, annular, elastically deformable wiper extending peripherally radially outwardly and axially forwardly from said plunger tip at a forward portion thereof at an acute angle to the longitudinal center axis of said plunger tip and terminating at the outer edge

thereof in a wiping edge having a minimal diameter slightly in excess of the diameter of the inner wall of said barrel, thereby forming a sealing engagement with the inner wall of said barrel, said annular wiper being the sole sealing element between said plunger tip and said wall, said plunger being spaced from said barrel along the length thereof so that axial movement between said plunger and said barrel is substantially free of frictional contact except for the contact by said sole sealing element, said syringe having a hypodermic needle attached thereto;

said method comprising moving said plunger tip axially fowardly to expel liquid anti-coagulant and air from said barrel until initial contact of said tip with the barrel end is made, whereby a predetermined amount of said anti-coagulant remains in said barrel; followed by inserting said needle into a blood vessel of a patient and permitting the blood pressure in said blood vessel to move said plunger tip and plunger axially rearwardly in said barrel to take a sample of blood.

4,372,326

MANUFACTURING MACHINE FOR PRODUCING TWO CONTINUOUS CIGARETTE RODS

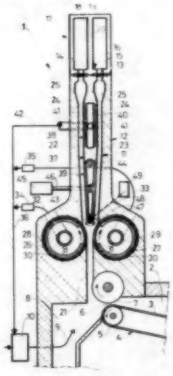
Enzo Serganoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Italy

Filed Apr. 16, 1981, Ser. No. 254,975

Claims priority, application Italy, May 26, 1980, 48787 A/80; Feb. 16, 1981, 47806 A/81; Feb. 16, 1981, 47807 A/81

Int. Cl.³ A24C 5/18, 5/39

U.S. Cl. 131—84 B **21 Claims**



1. A manufacturing machine for simultaneously producing two continuous cigarette rods comprising a substantially horizontal suction conveyor mobile in a predetermined direction of movement, and a duct extending upwards and terminating below said suction conveyor to feed the same with a continuous flow of shredded tobacco particles, said duct comprising a lower inlet portion consisting in a single conduit having an elongated cross-section substantially parallel with said direction of movement, and an upper outlet portion comprising two channels extending fork-like from an upper end of said conduit, said two channels having elongated inlet cross-sections arranged parallel with the cross-section of said conduit, and being side-by-side in a direction transverse to said direction of movement.

4,372,327

CUTTING HEAD FOR A CIGARETTE FILTER ATTACHMENT MACHINE

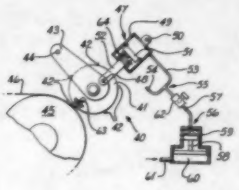
Derek H. Dyett, and Neil Thorp, both of High Wycombe, England, assignors to Molins Limited, Bucks, England

Filed Mar. 14, 1980, Ser. No. 130,351

Claims priority, application United Kingdom, Mar. 16, 1979, 7909301; Dec. 11, 1979, 7942620

Int. Cl.³ A24C 5/56

U.S. Cl. 131—95 **12 Claims**



1. A cutting head for a cigarette filter attachment machine, for cutting a filter attachment web at regular intervals in cooperation with a cutting drum, comprising a rotary member which carries one or more knives protruding therefrom, each knife having a longitudinal cutting edge, means for rotating said rotary member, said rotary member being mounted on its opposite ends on two carrier members each of which is movable towards the cutting drum independently of the other carrier member so that movement of both carrier members towards the cutting drum ensures contact of each knife with the cutting drum along substantially the entire length of the knife, and including means for urging both carrier members towards the cutting drum so as to bias said rotary member toward said cutting drum and drive each knife repeatedly into contact with said cutting drum as said rotary member is rotated.

4,372,328

FIBROUS MATERIAL FOR TOBACCO SMOKE FILTER

Erwin Kausch, Jesteburg, and Folkhard Tödter, Hamburg, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,640

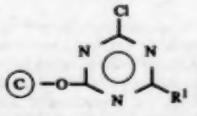
Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019163

Int. Cl.³ A24D 3/10

U.S. Cl. 131—332 **8 Claims**

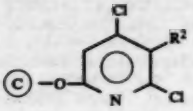
4. A method of removing at least some of the gas phase components from tobacco smoke, comprising:

contacting said tobacco smoke containing gas phase components with a filter material comprising cellulose fibers containing amino groups, said filter material prepared by (a) introducing reactive groups into the cellulose molecule to give the reactive cellulose derivative structures:



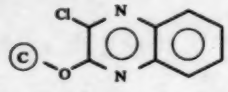
(I)

where R^1 is chlorine or amino and C —O— is a cellulose radical,

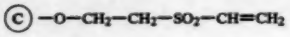


(II)

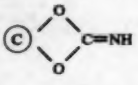
where R^2 is hydrogen or chlorine,



(III)

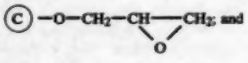


(IV)



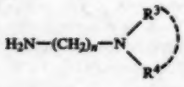
(V)

or



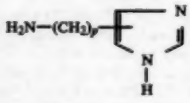
(VI)

(b) reacting the resulting reactive cellulose groups with ammonia, guanidine, aminoacids having a ratio of amino groups to carboxyl groups of not less than 2:1, diamines of the general formula



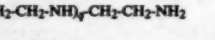
(VII)

where n is 2–6 and R^3 and R^4 are each, independently of one another, hydrogen or alkyl groups having 1–4 carbon atoms or together form a cyclopentyl, cyclohexyl, pyrrol, imidazole, pyrrolidine, piperidine or morpholine ring, or polyamines of the general formula



(VIII)

where p is 2–6, or polyethyleneimines of the formula



(IX)

where q is 1–6.

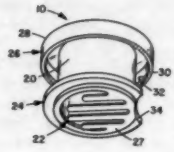
4,372,329

COMPRESS ROLLER CURLER

Alphonso W. Brown, Jr., 56 Alberge La., Baltimore, Md. 21220

Filed Jun. 5, 1981, Ser. No. 270,984
Int. Cl.³ A45D 2/00
U.S. Cl. 132—40 **1 Claim**

1. In a system for treating strands of hair on a human scalp, comprising a tubular body having an outer end and an inner end, said body being of material rendering said body resiliently compressible axially; guide means, including bellows-like convolutions in the body, for winding said hair; a respective flange-like member, larger in diameter than the body, on the outer end of the body and on the inner end of the body; and means for holding the body axially compressed for gripping hair wound around the body, the improvement comprising: said inner flange-like member having: a comblike securance thereon at the bottom inner end of the body for engaging the hair of a user, and a peripheral opening therein in position for receiving from said comblike securance said hair engaged by said comblike securance; said body having a circumferential



slot through the upper wall thereof to help hold ends of hair wound around said body in said spiral convolutions, and the outer flange-like member and the inner flange-like member having respective engaging means for snapping them together into engagement when said body is axially compressed, for holding said hair wound on said body.

4,372,330

METHOD AND APPARATUS FOR ATTACHMENT OF HAIR UNITS

Charles W. Nelson, Mission, Kans., assignor to Apollo Hair Systems, Inc., Mission, Kans.

Filed Oct. 13, 1981, Ser. No. 310,732
Int. Cl.³ A41G 3/00
U.S. Cl. 132—53 **2 Claims**

1. A method of attaching a hair unit by anchoring a braid to the natural hair of a recipient comprising the steps of:

(a) gathering several strands of hair into a tuft;

(b) providing filament means presenting a pair of juxtaposed filament stretches;

(c) anchoring said filament stretches to said tuft intermediate the ends of said filament stretches so as to form at least one filament pair;

(d) twisting the members of said filament pair about each other so as to form a first winding having a first direction of rotation, a second winding having a direction of rotation opposite to said first winding, the portion of said stretches between said windings defining an eye;

(e) passing the free ends of said strands of said tuft through said eye;

(f) locking said tuft in said eye by shifting said respective windings together for restricting said eye and capturing said tuft;

(g) gathering several strands of hair into a second tuft;

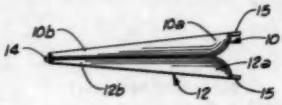
(h) passing said second tuft between said members of said filament pair;

(i) successively repeating steps (d) through (h) inclusively, using respective additional tufts.

4,372,331
LIPSTICK APPLICATOR DEVICE

Howard Thompson, 125 NW. 5th St., Oklahoma City, Okla. 73102

Filed May 29, 1981, Ser. No. 268,479
Int. Cl.³ A45D 40/22
U.S. Cl. 132—88.7 16 Claims

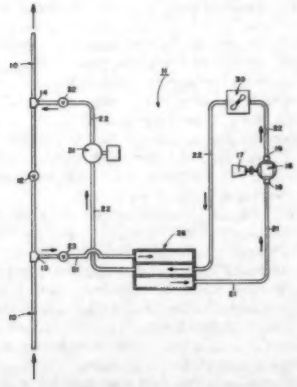


1. A lipstick applicator device comprising:
a first compact half including a substantially planar back having a wide side and a narrow side;
a second compact half including a substantially planar back having a wide side and a narrow side;
an edge formed about the border of each compact half, each of said edges extending generally uprightly from its associated back and including a thick edge along said wide side and a thin edge along said narrow side;
partition means extending generally uprightly from each of said backs, said partition means and said thin edges forming a recess therebetween;
hinge means joining said compact halves to each other at the thin edges thereof;
means for maintaining a body of lipstick in each of said recesses; and
an arcuate body of lipstick received in each of said recesses such that when said compact halves are pivoted to an opened position in back-to-back relation, said arcuate bodies of lipsticks overlie each other at a location adjacent the thin edges of the compact halves, and in positions conforming to the natural position of the lips.

4,372,332
COMPRESSOR STATION FOR ARCTIC GAS PIPELINE

Burton T. Mast, 9419 Stockport, Spring, Tex. 77373

Filed Jan. 28, 1981, Ser. No. 229,207
Int. Cl.³ F17D 1/07
U.S. Cl. 137—1 10 Claims

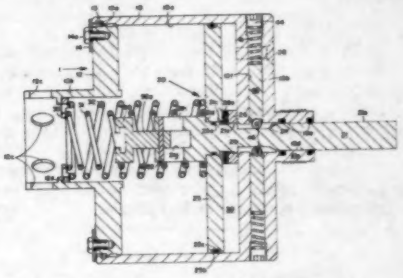


1. In a method for transporting gas through a pipeline system comprising a long pipeline for transporting cold gas from arctic regions through freezing ground, and a plurality of recompression stations spaced along the length of the pipeline, each station receiving upstream from the pipeline decompressed gas and returning downstream to the pipeline recompressed cold gas to thereby overcome the transmission pressure losses through the pipeline, the improvement including:
(a) recompressing the received decompressed gas from the pipeline;
(b) cooling the recompressed gas resulting from step (a) with ambient air;
(c) further cooling the recompressed gas resulting from step (b) with the received decompressed cold gas from the pipeline before recompressing the decompressed gas as provided in step (a); and
(d) injecting the recompressed gas resulting from step (c) into the pipeline.

4,372,333
VALVE ACTUATING APPARATUS AND METHOD

Kip B. Goans, Harvey, La., assignor to Baker CAC, Inc., Belle Chasse, La.

Filed Aug. 24, 1981, Ser. No. 295,203
Int. Cl.³ F17D 3/00; F16K 31/122
U.S. Cl. 137—1 16 Claims



13. The method of operating a fluid pressure actuator for moving a cooperating member, said actuator being of the type wherein fluid pressure moves a shaft of the actuator in one direction and an axially disposed bias member returns the shaft in the opposite direction to its starting position comprising the steps of:
(1) applying fluid pressure to initiate movement of the actuator shaft;
(2) during the initial fluid pressure induced movement of the actuator shaft, exerting a force on a generally radially disposed energy storing element through the cooperation of a plunger disposed between the energy storing element and a cam surface on said shaft prior to actuation of said cooperating member, thereby storing energy in said energy storing element during the initial portion of the fluid pressure induced stroke of the shaft; and
(3) releasing said fluid pressure and permitting the shaft to return to its starting position under the force of the axially disposed springs until said plunger engages said cam surface and releases the stored energy in the energy storing element by imparting an axial thrust to the final portions of the return stroke of the shaft.

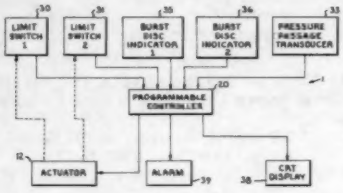
4,372,334
OVERPRESSURE RELIEF CONTROL SYSTEM

Herman L. Paul, Jr., Lebanon, Pa., assignor to Continental Disc Corporation, Kansas City, Mo.

Continuation-in-part of Ser. No. 264,355, May 18, 1981, and Ser. No. 264,276, May 18, 1981. This application Sep. 18, 1981, Ser. No. 303,346
Int. Cl.³ F17D 1/00
U.S. Cl. 137—12 14 Claims

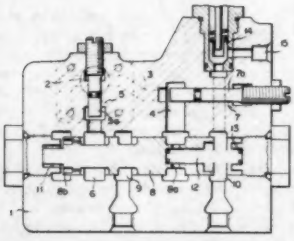
1. A method of relieving an overpressure condition within a pressurized system having a pressure passage to vent pressurized fluid therefrom comprising the steps of:

(a) providing at least two relief passages for flowing a pressurized fluid to a safe discharge location;
(b) interconnecting said relief passages with said pressure passage by means of a valve normally in a first position to provide full flow communication between said pressure passage and a first of said relief passages, said valve including motor means to move said valve between said first position and a second position providing full flow communication between said pressure passage and a second relief passage;



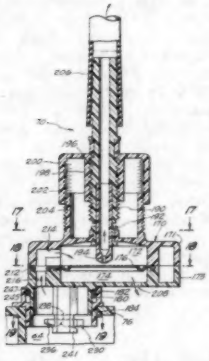
(c) providing each relief passage with an overpressure relief device having a respective overpressure rating, said relief device in the first relief passage being a rupture disc;
(d) sensing the integrity of said rupture disc;
(e) sensing the pressure within said pressure passage; and
(f) upon sensing the rupture of said rupture disc and upon the pressure in said pressure passage decreasing to a selected first fraction of the overpressure rating of the relief device in said second relief passage, controlling said motor means to place said valve in said second position.

4,372,335
FLOW DIVIDER VALVE ASSEMBLY
Hideyori Sato, Funabashi; Nobuaki Inaba, Yokohama, and Shigeru Shinohara, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Feb. 24, 1981, Ser. No. 237,769
Claims priority, application Japan, Feb. 29, 1980, 55-24934[U]
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—101 **3 Claims**



1. A flow divider valve assembly, comprising:
a valve body defining an inlet port to be connected to a source of fluid under pressure, a priority flow outlet port, an excess flow outlet port and a valve bore interconnecting said ports;
a valve spool axially moveable within said valve bore, said valve spool having formed therein an axial bore for permitting a constant communication between said inlet port and said priority flow outlet port;
biasing means disposed in the axial bore of said valve spool for biasing said valve spool in a direction toward opening said priority flow outlet port;
first restrictor means disposed between said inlet port and said priority flow outlet port for adjustably restricting the flow rate thereacross thereby allowing a controlled flow rate to pass therethrough; and
second restrictor means disposed between said inlet port and said excess flow output port for adjustably restricting the flow rate thereacross, said second restrictor means being adapted to gradually increase said controlled flow rate through said first restrictor means when the rate of flow from said inlet port to said excess flow outlet port increases.

4,372,336
CHEST DRAINAGE UNIT
William D. Cornell, Ballwin; Ronald Crouther, Manchester; Howard P. Dyer, Webster Groves, and Alan B. Ranford, Des Peres, all of Mo., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.
Filed Jun. 17, 1980, Ser. No. 160,447
Int. Cl.³ A61M *1/00*
U.S. Cl. 137—205 **2 Claims**



1. In a chest drainage apparatus comprising a casing having a collection chamber therein for receiving fluid to be drained from a chest cavity, means defining an inlet opening into said collection chamber for establishing fluid communication between said collection chamber and a patient's chest cavity to be drained, means defining an outlet adapted to be connected in fluid communication with a source of suction, means defining a liquid seal between said collection chamber and said outlet, and a suction regulator for limiting the amount of suction applied to said collection chamber via said outlet and said liquid seal, the improvement comprising:
said suction regulator comprising:
a regulator housing defining a suction regulator chamber;
means defining an outlet opening from said regulator chamber which is in fluid communication with said collection chamber via said liquid seal;
means defining an inlet opening into said regulator chamber which is adapted to be connected to a source of suction;
pressure responsive means responsive to suction above a predetermined level in said collection chamber to block suction above about said predetermined level from said inlet opening chamber until the suction in said collection chamber drops to about said predetermined level;
said pressure responsive means comprising a flexible diaphragm in said regulator chamber;
a nozzle extending into said inlet opening in said regulator chamber; said nozzle including an outlet opening disposed adjacent one surface of said flexible diaphragm, whereby suction above said predetermined level at said one surface of said diaphragm in the vicinity of said nozzle will move a portion of said diaphragm against said nozzle outlet; and
means for manually moving said nozzle toward and away

from said flexible diaphragm so as to vary said predetermined level of suction at which said diaphragm in the vicinity of said nozzle will move against said nozzle outlet.

4,372,337

ROTARY DISTRIBUTOR VALVE

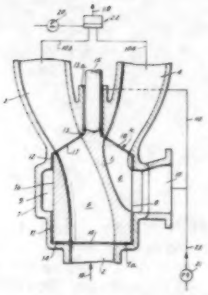
Kurt Holzenberger, Frankenthal, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Jan. 7, 1980, Ser. No. 109,922

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1979, 2902364

Int. Cl.³ F16K 5/08

U.S. Cl. 137—240 12 Claims



1. A valve for connecting a first conduit which delivers a first fluid with a selected one of several second conduits, comprising a housing having a first opening constituting a first inlet and communicating with the first conduit, a second opening constituting a second inlet, and a plurality of third openings each constituting an outlet and each communicating with a different one of said second conduits; a valving element rotatable in said housing and having a first passage including a first open end in permanent communication with said first opening and a second open end movable into register with a selected third opening in response to rotation of said valving element in said housing, and a second passage having a first open end in permanent communication with said second opening and a second open end registering with one of said third openings when the second open end of said first passage registers with another of said third openings, said valving element further having a peripheral surface and at least one additional surface and defining with said housing a plurality of clearances adjacent to said surfaces and communicating with said second opening and with said second passage; and means for admitting a second fluid into said housing via said second opening whereby said second fluid penetrates into and continuously rinses said clearances.

4,372,338

HIGH PRESSURE VALVE ASSEMBLY

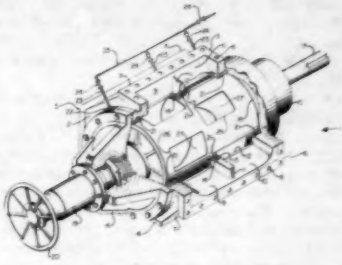
Chester C. Efferson, Ethel, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 22, 1980, Ser. No. 171,098

Int. Cl.³ F16K 5/22; B08B 3/04

U.S. Cl. 137—240 4 Claims

1. In a valve assembly adapted to receive a slurry at relatively low pressure and discharge the slurry to a system at relatively high pressure and comprising a housing having a low pressure slurry inlet and outlet means on opposite sides of said housing, a high pressure fluid inlet and slurry outlet means on opposite sides of said housing separated from said low pressure slurry inlet and outlet means, and a tapered valve plug having a plurality of offset ports therein defining the openings of a valve chamber between corresponding pairs of inlet and outlet offset ports, said valve plug being rotatably supported in said housing at one end by bearings and a drive shaft passing through a first end cover and at the other end of said housing by a laterally adjustable means passing through a second end cover, said valve plug ports being in registry with said housing inlets and outlets in a predetermined sequence during rotation of said valve plug, the improvement comprising means defining at least one annular groove contained in exposed communication between the radially separated relatively rotating surfaces of said valve plug and said housing at a selected longitudinal location corresponding to a location of potential banding wear therebetween, conduit means adapted continuously to supply fluid of the character of that being transferred from the low pressure side to the high pressure side from a source to said at least one groove and control means operative to control fluid flow in said conduit means so that upon rotation of said valve plug fluid in said conduit means is provided to said groove to establish a continuous lubricating/flushing flow between said housing and said valve plug surfaces thereat.



4,372,339

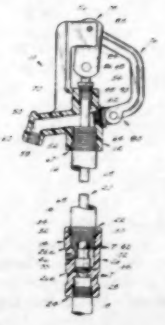
YARD HYDRANT

Stephen J. Anderson, Storm Lake, Iowa, assignor to Merrill Manufacturing Company, Storm Lake, Iowa

Filed Nov. 26, 1980, Ser. No. 210,670

Int. Cl.³ E03B 9/04, 9/14

U.S. Cl. 137—288 6 Claims

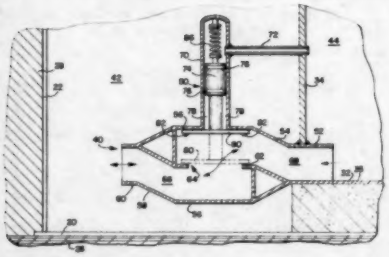


1. In a yard hydrant of the class having a head chamber with integral nozzle, a standpipe secured at one end to said head chamber and secured at its other end to a valve housing adapted to be connected to a source of water under pressure, a valve assembly including a valve stem disposed in said standpipe and operable relative to said housing and means for operating said valve assembly, an improvement in said housing and valve assembly, comprising:

said housing being hollow having an upper internally threaded end for attachment to said standpipe, a lower end

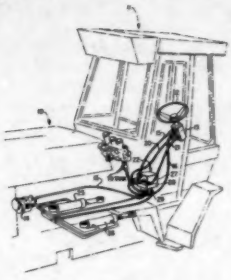
for attachment to said source of water supply and a central section defining a valve head rec..iving axial bore concentrically reduced relative to said upper and lower ends,
said axial bore terminating in a valve seat concentric with a water passageway to said lower end,
a water flow channel within said housing and within an area of lesser diameter than the upper internally threaded end of said housing communicating with said axial bore from a point spaced a predetermined distance above said valve seat and extending therefrom to communication with said upper end,
said axial bore having a full circle area only intermediate said valve seat and the lowermost limit of said water flow channel,
a drain hole in said housing communicating with said axial bore,
a valve head on said valve stem disposed in fluid seal engagement in said axial bore, and
the means for operating said valve assembly effecting the reciprocation of said valve stem whereby in closed position, said valve head is in fluid seal engagement with said valve seat and said full circle area below said drain hole to open said hole to communication with said axial bore and said upper end and in the movement of said valve head off of said valve seat towards open position, water flow from said lower end through said water flow channel to said upper end, standpipe and nozzle is withheld while said valve head remains in the full circle area of said axial bore during which time said valve head registers with said drain hole to close the same before it has moved out of the full circle area to expose said water flow channel to communication with said lower end.

4,372,340
LIQUID STORAGE TANK
Elmer W. Rothrock, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.
Filed Sep. 29, 1980, Ser. No. 191,505
Int. Cl.³ F16K *21/04*
U.S. Cl. 137—576 **11 Claims**



1. A storage tank comprising:
internal and external spaced apart walls defining a first liquid storage space between the two walls and a second liquid storage space surrounded by the internal wall;
each of the internal and external walls being joined to a bottom;
the first and second liquid storage spaces being adapted to store liquid in each at the same height at maximum capacity;
at least one fluid conduit means in fluid flow communication with and between the first and second storage spaces; and
valve means disposed in one of said storage spaces, normally open regardless of the liquid level in the second liquid storage space, capable of blocking fluid flow through the fluid conduit means from the second storage space to the first storage space and including means responsive to the liquid level in said second storage space for closing said valve means upon loss of liquid from the first storage space to outside the tank.

4,372,341
ROTARY SWITCH VALVE
Harry D. Crawley, Winnipeg, Canada, assignor to Versatile Cornat Corporation, Vancouver, Canada
Filed May 28, 1980, Ser. No. 154,078
Int. Cl.³ F16K *11/00*
U.S. Cl. 137—580 **2 Claims**



1. A rotary switch valve rotatable through 180° from a first to a second operating position re-directing the flow of hydraulic fluid in a hydraulic system, said switch valve comprising:
(a) a casing, said casing having an interface and an outer surface;
(b) a spool, said spool having an interface and outer surface, said spool being mounted with said spool interface adjacent and opposed to said casing interface, said spool being rotatable relative to said casing about a common longitudinal central axis;
(c) said casing and said spool having a cavity located between the respective interfaces;
(d) each of said spool and said casing having pressure, tank, left steering and right steering passageways therein, each of said passageways running from said respective outer surface; said left and right steering passageways of said spool and casing at said respective interface being symmetrical about said axis, said left and right steering passageways in said casing interface being aligned with said left and right steering passageways in said opposed cavity spool interface, respectively, when said valve is in said first operating position;
(e) inserts with substantially flat end faces on one end, the opposite ends of said inserts being inserted in said pressure and said left and right steering passageways in one of said spool and casing interfaces, each of said inserts having a shoulder within said cavity and a pressure producing washer mounted between said shoulder and said interface in which said inserts are inserted, said flat end faces exerting a pressure on and contacting the opposed interface;
(f) said left and right steering passageways of said spool at said spool interface being aligned with said right and left steering passageways of said cavity at said cavity interface, respectively, when said spool is rotated through substantially 180° relative to said casing to said second operating position.

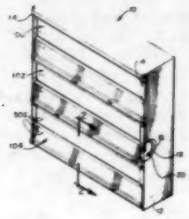
4,372,342
BALANCING DAMPER WITH QUICK SET ADJUSTMENT BRACKET
Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901
Filed Aug. 29, 1980, Ser. No. 182,506
Int. Cl.³ F16K *13/00*
U.S. Cl. 137—601 **7 Claims**

1. In a damper adapted for use in a duct and having a frame

and at least one pivotally mounted blade movable between an open and a closed position with respect to said frame, an improved adjustment means comprising:

(a) an adjustment plate attached to said blade and including portions which extend along portions of said frame and an arcuate slot which defines the angle through which said blade can pivot; and

(b) means for locking said blade in a selected position, extending through portions of said duct and the arcuate slot of said adjustment plate and into threaded engagement with said frame;



(c) wherein said damper and said adjustment plate are capable of being contained within said duct;

so that tightening said locking means clamps said adjustment plate between said frame and said duct, thereby restraining said blade, and so that loosening said locking means permits movement of said blade.

4,372,343

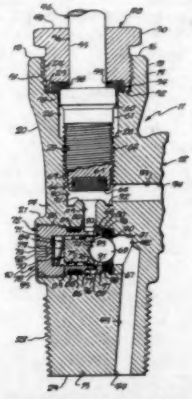
PRESSURE-RETAINING VALVE AND METHOD OF RETAINING PRESSURE

Joseph C. Trinkwalder, Jr., North Tonawanda, N.Y., assignor to Sherwood Selpac Corp., Lockport, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,166

Int. Cl.³ F16K *17/26*

U.S. Cl. 137—614.2 **13 Claims**



1. In a body provided with a fluid flow passageway therethrough, said passageway having an inlet at one end thereof and having an outlet at its other end, the improvement which comprises:

a pressure-retaining valve mounted on said body and operatively associated with said passageway to normally prevent the pressure at said inlet from equalizing with the pressure at said outlet, said pressure-retaining valve including

an annular seat mounted on said body about said passageway and facing away from said inlet;

a poppet member mounted on said body for movement toward and away from said seat, one of said seat and poppet member being formed of a resilient material;

a spring engaging said body and urging said poppet member to move toward said seat, the force exerted by said spring on said poppet member being equal in magnitude to an opposing force exerted on said poppet member by a predetermined differential between the pressures at said inlet and outlet such that, when such pressure differential falls below said predetermined differential, said poppet member will move toward and sealingly engage said seat to interrupt flow through said passageway, said poppet member being also adapted to move through said seat by deformation of said one resilient member to permit a reverse flow through said passageway from said outlet to said inlet.

4,372,344

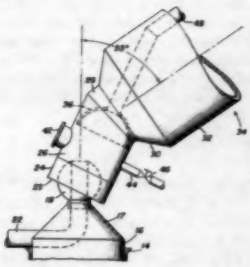
BALL AND SOCKET JOINT WITH FLUID FLOW CAPABILITY THROUGH THE JOINT

Donald C. Stafford, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sep. 29, 1980, Ser. No. 191,717

Int. Cl.³ F16L *27/00*; B63B *21/52*

U.S. Cl. 137—615 **15 Claims**



1. Apparatus comprising:

a ball joined to a first element with a hole extending through the ball and first element;

a socket having a spherical internal surface;

a shell, having an end portion directly joined to the socket, defining with soil socket enclosed chamber;

said socket containing the ball in mating and nesting fluid tight arrangement with the hole in the ball in direct fluid communication with and running out from the chamber; and

a fluid conduit in communication with the chamber.

4,372,345

FAIL-SAFE VALVE

Richard J. Mehus, Minneapolis, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jul. 13, 1981, Ser. No. 282,924

Int. Cl.³ B08B *3/08*; F16L *55/14*

U.S. Cl. 137—636 **8 Claims**

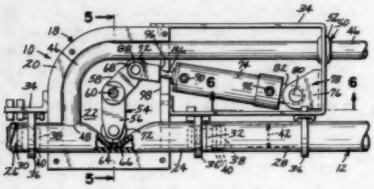
1. Valving apparatus for selectively sanitizing the teat cups of one of a plurality of milking claws in an automatic milking system each claw havng a main milk line through which milk is conducted from the claw to a collection and storage container, comprising:

(a) a housing having a peripheral wall;

(b) a resilient main line insert carried by said housing and

extending therethrough, said insert being adjacent at least a portion of said peripheral wall, said insert being insertable in a discontinuity in each main milk line to have an entrance communicating with an up-flow portion of the main line and an exit communicating with a down-flow portion of the main line;

(c) a flushing conduit extending between a source of sanitizing agent and the main milk line for use in backflushing the milking claws, said conduit intersecting said insert within said housing and having a resilient portion within said housing and adjacent at least a portion of said peripheral wall; and



(d) a pinching element, having angularly spaced first and second arms with remote ends, mounted within said housing for pivoting about a first axis between first and second positions, wherein said remote end of said first arm, when said element is in said first position, pinches closed said insert between said remote end and said portion of said peripheral wall to which said insert is adjacent, at a location along said insert down-flow of the intersection of said conduit with said insert, and wherein said remote end of said second arm, when said element is in said second position, pinches closed said flushing conduit between said remote end and said portion of said peripheral wall to which said conduit is adjacent.

4,372,346

ELECTRICAL WARP THREAD-MONITORING APPARATUS FOR A LOOM

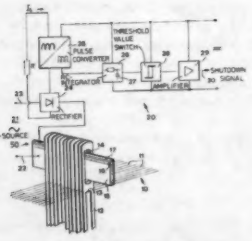
Wilhelm Hutter, Roggwil, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Aug. 15, 1980, Ser. No. 178,640

Claims priority, application Switzerland, Sep. 3, 1979, 7938/79

Int. Cl.³ D03D *51/28*

U.S. Cl. 139—353 **3 Claims**



1. An electrical warp thread-monitoring apparatus for a loom for monitoring warp threads, comprising:

a plurality of drop wires;

each of said drop wires being supported by a re-related warp thread;

current rails extending over the entire width of the warp threads;

said current rails being electrically connected with one another upon rupture of at least one of the warp threads by the related drop wire which drops into contact with said current rails;

means defining an alternating-current circuit in which there are conjointly arranged said current rails in order to generate a shutdown signal for the loom in the presence of rupture of a warp thread;

an alternating-current voltage source connected by means of said current rails with an input side of said alternating-current circuit;

said means defining said alternating-current circuit comprising:

a voltage-dependent pulse converter having an input side; and

a bridge rectifier;

said alternating-current voltage source being connected by means of said bridge rectifier with said input side of said voltage-dependent pulse converter; and

said pulse converter delivering an output signal constituting a base signal for the shutdown signal.

4,372,347

HYBRID WOVEN GLASS CLOTHS

Larry D. Olson, Viroqua, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1981, Ser. No. 334,500

Int. Cl.³ D03D *15/00*

U.S. Cl. 139—420 C **4 Claims**

1. A hybrid glass cloth woven from yarn comprising a warp yarn of fiberglass and a fill yarn of a boron nitride.

4,372,348

BLOWING NOZZLE HAVING A SHIELDED BLOWING APERTURE, ADAPTED FOR USE IN A SHUTTLELESS WEAVING MACHINE

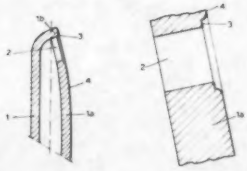
Paul Gunneman, Medevoort 15, 5731 RM Mierlo, Netherlands

Filed Feb. 6, 1981, Ser. No. 232,160

Claims priority, application Netherlands, Feb. 11, 1980, 8000836

Int. Cl.³ D03D *47/28*

U.S. Cl. 139—435 **3 Claims**



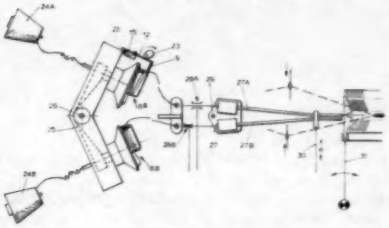
1. A blowing nozzle, for supplying a jet of fluid to assist in transporting a weft thread through a weaving shed, which is in the form of a hollow needle having at least one blowing aperture in its side wall, the outer end of said aperture being surrounded by a first surface which is recessed relative to a second surface on the needle adjacent to said first surface, characterized in that the second surface has a rounded edge adjacent to the first surface.

4,372,349

METHOD FOR WEAVING WITH A SHUTTLELESS WEAVING MACHINE, AND WEFT PREPARATION DEVICE TO BE USED THEREIN

Hubert P. Van Mullekom, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Sep. 4, 1980, Ser. No. 184,111
Claims priority, application Netherlands, Sep. 24, 1979, 7907093
Int. Cl.³ D03D 47/36
U.S. Cl. 139—452 2 Claims



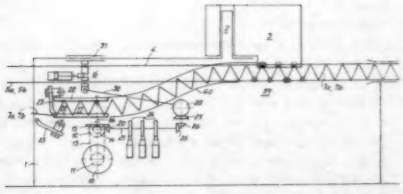
1. A method of preparing wefts on a plurality of winding drums for withdrawal by a weft conveyor, comprising the steps of continuously winding a separate thread at a constant rate on each drum, and releasing on each drum successive groups of the resulting windings for withdrawal from the drum, each such group of windings having a total length corresponding to a weft length, wherein the improvement comprises the steps of withdrawing by means of a weft conveyor a plurality of such groups in succession from one drum, and then blocking the withdrawal of a group of windings which have been released on said drum while withdrawing a group of windings which have been released on a drum other than said drum.

4,372,350

MACHINE FOR THE AUTOMATIC PRODUCTION OF WELDED LATTICE GIRDERS

Gerhard Schmidt; Klaus Ritter; Gerhard Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-und-Verwertungs Gesellschaft mbH, Graz, Austria

Filed Jul. 29, 1980, Ser. No. 173,672
Claims priority, application Austria, Aug. 3, 1979, 5340/79
Int. Cl.³ B21F 15/08, 27/10
U.S. Cl. 140—112 2 Claims



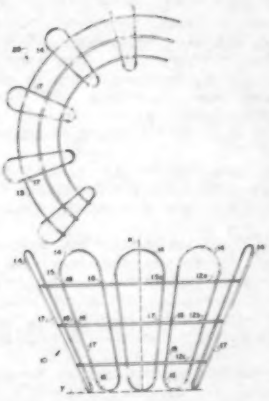
1. In a machine for the automatic production of a welded lattice girder which consists of an upper chord, at least one lower chord and zigzag strutting between said upper chord and said lower chord defining periodic bending regions, said machine comprising a feed mechanism for the stepwise feeding of wire material for said chords, a continuously working bending mechanism for the production of a stock of said zigzag strutting, and an intermittently working welding mechanism for welding the bending regions of said strutting to said chords; the improvements wherein between said bending mechanism and said welding mechanism there are provided guides adapted to embrace said bending region of said zigzag strutting and leading substantially tangentially into paths along which said upper and lower chord wires are respectively fed, whereby said guides form storage means for said strutting in which said strutting is arranged to be resiliently contracted and expanded in a controlled manner, and wherein said welding mechanism includes two holding fingers adjacent said feed path for said lower chord wire and offset with respect to one another in the direction of feed by one wavelength of said zigzag strutting and means causing said holding fingers to be inserted into adjacent lower bending regions in said zigzag strutting to hold the strutting in place during pauses used for welding between two steps in the stepwise feed of said chord wires to thereby fix the required relative positions between said strutting and said chord wires during welding, the welding being done at a lower bending region which is spaced from the adjacent lower bending regions held in place by the holding fingers by at least one wavelength of zigzag.

4,372,351

WIRE TREE BASKETS AND A METHOD AND APPARATUS FOR FORMING SAME

John W. Myers, Greensboro, N.C., assignor to Hemco Wire Products, Inc., Greensboro, N.C.

Filed Aug. 3, 1981, Ser. No. 289,661
Int. Cl.³ B21F 15/08, 27/10
U.S. Cl. 140—112 3 Claims



1. A method of producing a truncated cone shaped wire basket formed of a plurality of wire rings of differing diameter joined by vertical wire members, the steps of said method comprising:

(a) cutting a wire strand material of desired metallic content and gauge into a plurality of first segments with each segment being of a length corresponding to the circumference of one of the various circular rings which form the side wall of the completed basket;

(b) cutting additional lengths of said wire material into second segments which are of a length to form the vertically extending, horizontally spaced wire members which connect the circular rings to form the completed baskets;

(c) bending each one of said first segments into an arc having a prescribed radius less than that of a complete circle;

(d) arranging the plurality of wire arcs on a substantially flat surface in concentrically arranged spaced relationship to each other;

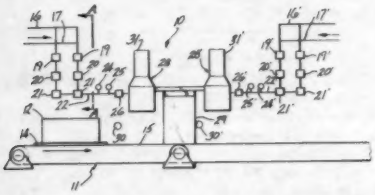
(e) placing said second wire segments onto said flat surface in horizontally spaced relationship to each other, and into engagement with the arcuate segments;

(f) welding all intersecting points of said arcuate segments and said vertical segments to form a basket flat;
(g) subjecting said basket flat to a bending machine to shape said flat into a truncated conical shape; whereby the ends of said arcuate segments will be in substantially end-to-end, abutting relationship to form a circle;
(h) joining the ends of said arcuate segments to close the circular rings, thereby completing the wire basket.

4,372,352
FOAM DISPENSING APPARATUS

Pasquale J. Coppola, Meriden, and Gerald V. Dever, Jr., Milford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 9, 1981, Ser. No. 241,899
Int. Cl.³ B65B 3/04
U.S. Cl. 141—1 15 Claims



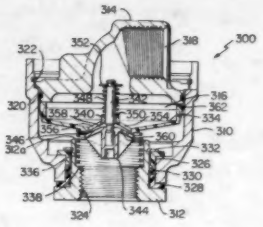
10. A method of filling building blocks with an insulating foam utilizing foam dispensing apparatus having a plurality of orifice rods with predetermined sized orifices therein to control the impingement pressure of the plural feed foam mix components as the components enter the mixing chamber within each foam dispensing head; comprising the steps of:
(a) feeding a plurality of blocks with predetermined cavities therein in arrayed banks along a predetermined path of travel;
(b) automatically sensing the presence of a bank of blocks at a first predetermined point along the predetermined path;
(c) preselecting a predetermined sized orifice for each orifice rod;
(d) automatically activating the foam dispensing apparatus in response to the sensing of the bank of blocks to cause the plural feed foam mix components to be passed through orifices into a mixing chamber within each foam dispensing head at a predetermined impingement pressure to ensure the proper admixing of the plural foam mix components into a mixed foam;
(e) automatically injecting the mixed foam into the cavities of the blocks in the sensed bank; and
(f) automatically ceasing injecting the mixed foam into the cavities of the blocks after a predetermined amount of time.

4,372,353
ARRANGEMENTS FOR SENSING THE PRESENCE OF LIQUID IN A VAPOR LINE

Tom Weas, Cincinnati, Ohio, assignor to Dover Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 45,204, Jun. 4, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 208,998
Int. Cl.³ B65B 3/18, 57/14
U.S. Cl. 141—206 25 Claims

1. An arrangement for sensing the presence of liquid in a vapor line including a body having an inlet communicating with a source of liquid and vapor and an outlet communicating with an area for receiving vapor, said body having passage means therein connecting said inlet and said outlet, said body having first and second valves disposed in said passage means, said body having a seat for one of said first and second valves, said one valve of said first and second valves having a seat for the other of said first and second valves, means to continuously urge one of said one and other valves into engagement with its seat, and the other of said one and other valves being movable into engagement with its seat when a predetermined quantity of liquid flows into said inlet of said body in a predetermined period of time to block said passage means whereby the pres-

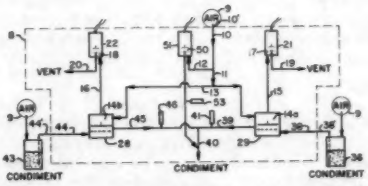


ence of liquid is sensed, and the one valve of said one and other valves being moved out of engagement with its seat if the pressure upstream of said inlet exceeds a predetermined pressure after the other valve of said one and other valves has engaged its seat.

4,372,354
CONDIMENT DISPENSER

Albert R. Moore, Miami, Fla., assignor to Burger King Corporation, Miami, Fla.

Filed Apr. 28, 1980, Ser. No. 144,155
Int. Cl.³ B67D 5/54
U.S. Cl. 141—361 10 Claims



1. A dispenser for dispensing a predetermined amount of condiment on a sandwich, said dispenser comprising:
a source of condiment;
a source of pressurized gas;
first conduit means communicating with said source of condiment;
a discharge means;
second conduit means communicating with the discharge means;
first valve means communicating with said first and second conduit means selectively connecting the first and second conduit means in flow communication for selective flow of condiment from the source to the discharge means, said first valve means including a first valve which is normally closed to prevent flow of condiment, said first valve being held normally closed at least partially by fluid pressure, said first valve means including a second valve operably associated with said first valve for selectively reducing said fluid pressure allowing said first valve to open;
first control means operably connected to said second valve for selectively effecting opening and closing of said second valve, said first control means being operable for automatically regulating the amount of condiment dispensed to a predetermined amount, said first control means including a first actuator means operable for initiating operation of the first control means;

third conduit means communicating with said source of pressurized gas;

fourth conduit means communicating with said source of pressurized gas and said first valve to provide the fluid pressure to hold said first valve normally closed;

fifth conduit means communicating with said discharge means;

a third valve communicating with said third and fifth conduit means selectively connecting said third and fifth conduit means in flow communication, said third valve being operably connected to said first control means whereby said third valve is open when said first and second valves are open; and

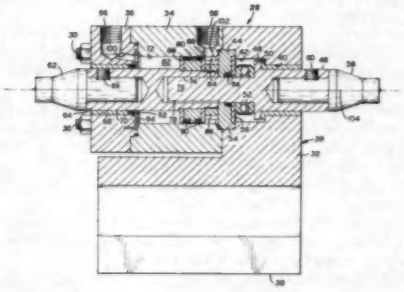
a stand having said discharge means and said first actuator means mounted thereon.

4,372,355

WOOD TURNING LATHE APPARATUS

Wallace B. Force, Jr., and Francis D. Jefferson, both of Wabash, Ind., assignors to Diehl Machines, Div. of Waltham Watch Company, Wabash, Ind.

Filed Nov. 17, 1980, Ser. No. 207,138
Int. Cl.³ B27C *7/00*; B23B *23/00*
U.S. Cl. 142—55 **7 Claims**



1. For use in a plural station wood turning lathe, a head and tail stock mounting apparatus comprising a supporting block unit, a head stock work center carried by said supporting block unit for rotation about a given axis but held against axial movement, a tail stock work center carried by said supporting block unit for rotation about either the same axis or one parallel thereto and also for limited reciprocable axial movement, and means for selectively reciprocating said tail stock work center, said means including a hydraulic power cylinder carried by said supporting block unit having a piston operatively connected to said tail stock work center, said power cylinder and piston including a shaft journalled for rotation within said block unit, said block unit having a sealed stationary cylindrical chamber coaxially surrounding at least a portion of said shaft, a piston element reciprocably and rotatably received within said chamber and dividing said chamber into two variable volume compartments, said piston element being connected to said shaft for imparting reciprocable movement thereto and for being rotated thereby, and two ports in said block unit, one for each compartment, whereby pressure fluid may be introduced into and exhausted from said compartments, respectively, for reciprocating said piston element.

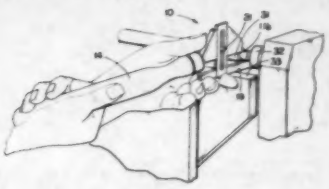
4,372,356

SIZING TOOL FOR DOWEL ENDS

James O. Conklin, 502 Tribune Bldg., Terre Haute, Ind. 47807

Filed Mar. 20, 1981, Ser. No. 245,935
Int. Cl.³ B23B *27/00*
U.S. Cl. 142—56 **4 Claims**

1. A hand-held tool for accurately sizing as to diameter a workpiece turning on a lathe, said tool comprising a generally triangular plate having truncated apices, a handle rigidly secured to one apex of the plate, a sharpened transverse edge formed at the truncated apex opposite said one apex, one face of said plate having a rectilinear groove extending from the third apex of said plate to the opposed base margin of the plate, an inverted generally T-shaped bar having its base-portion positioned in the plane of said plate and extending beyond said



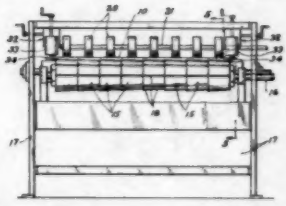
sharpened transverse edge of the plate, the leg portion of said bar being adjustably accommodated within said groove to permit adjustable spacing between said bar base portion and said sharpened plate edge, whereby said tool may be positioned so that said bar base portion may engage the underside of the turning workpiece and said sharpened edge of the plate may engage the turning workpiece reducing its diameter to that of the adjusted spacing between said bar base portion and said sharpened plate edge.

4,372,357

MACHINE FOR PROFILING WOOD PANEL TO SIMULATE LAP SIDING

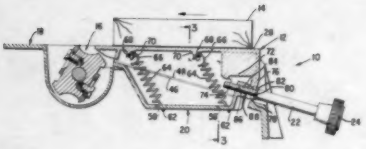
Virgil Stelling, Tacoma, Wash., assignor to Globe Machine Manufacturing Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 1,020, Jan. 5, 1979, Pat. No. 4,263,947. This application Dec. 19, 1980, Ser. No. 218,271
Int. Cl.³ B27C *1/00*
U.S. Cl. 144—114 R **2 Claims**



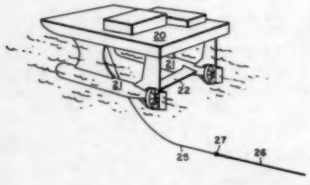
1. In a machine for shaping flat surfaces of relatively large flat panels of material capable of being cut by woodworking tools, a frame; upper and lower driven feed rolls carried by said frame, positioned to receive therebetween relatively large, flat, rectangular panels, and move said panels longitudinally through the machine; power driven cutter means positioned in the path of travel of panels through the machine to cut material from the board and provide a profile on one surface thereof simulating a plurality of rows of lap siding, said power driven cutter means comprising a plurality of planer type cutter heads secured in end-to-end abutting relation on said driven shaft; and peripheral knives carried by each cutter head having cutting edges extending from end to end of the head and positioned to move in a cone-shaped path when the head is rotated to profile one surface of the panel so it will have the appearance of lap siding.

4,372,358
JOINTER-PLANER IN-FEED TABLE
Thomas G. Glore, Easley, S.C., assignor to The Singer Company, Stamford, Conn.
Filed Nov. 6, 1980, Ser. No. 204,406
Int. Cl.³ B27C 1/14
U.S. Cl. 144—117 R 10 Claims



1. In-feed table assembly for mounting on a supporting base structure of a jointer-planer having a generally cylindrical cutter assembly rotatably mounted with the supporting base structure, the assembly comprising a table support of generally wedge-shaped configuration having a pair of generally parallel triangular side wall portions and a base panel extending therebetween carrying a ramp comprising a pair of generally parallel inclined generally flat ways, a table of generally wedge-shaped configuration carried on said ways and movable therealong to therewith define a generally rectangular block-shaped assembly of variable height, spring means for resiliently holding said table on said table support, manual adjusting means for moving the said table along said ramp, and means for adjustably affixing said table support to said supporting base structure.

4,372,359
METHOD FOR DEPLOYMENT OF A TOWED ARRAY FROM A SWATH SHIP
Paul A. Hanson, La Mesa; John D. Hightower, San Diego, both of Calif., and Alvah T. Strickland, Kaneohe, Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 30, 1981, Ser. No. 258,988
Int. Cl.³ B63B 21/66
U.S. Cl. 114—244 11 Claims



1. A method for deploying and recovering an apparatus to be towed in the water by a towcable attached between the apparatus and a vessel having a plurality of submerged hulls, comprising the steps of:

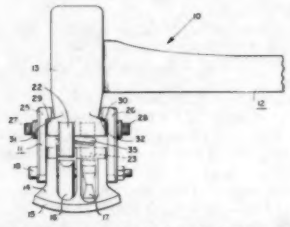
maneuvering the vessel in a reverse direction while paying out the apparatus from the underside of the vessel, the towcable and apparatus then streaming out in front of the vessel;

paying out the towcable at such a rate as to cause a section of the towcable near the vessel to sink beneath the vessel until that section forms a loop downward in the water; and

turning the vessel in a substantially pivotal direction to rotate above the loop;

whereby, when the vessel maneuvers into a straight forward direction from the turn it will pass over and clear the loop thereby causing the apparatus to be towed behind the vessel.

4,372,360
SPLITTING AXE
Harold E. Elchlin, Q-West Apt. L-207, Quakertown, Pa. 18951
Filed Jul. 29, 1981, Ser. No. 288,058
Int. Cl.³ B27L 7/00
U.S. Cl. 145—2 R 12 Claims



1. An implement particularly suited for splitting firewood, comprising: a head assembly and means connected to said head assembly for propelling the head assembly toward a log, said head assembly including:

a base member,

a blade member having an edge adapted to engage the wood,

means mounting said blade member for movement relative to said base member,

means interposed between said base and blade members for biasing said blade member away from said base member,

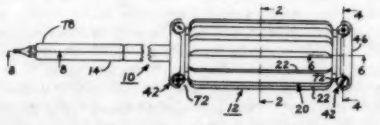
a pair of toggle links pivotally mounted to said blade member, each link having a working edge disposed to one side of said blade adjacent its edge and having a head on the other side of said blade remote from its edge,

striker means carried on said base member in spaced relation with said link heads for contacting said heads and rotating the links relative to one another, and

means connected to said toggle links for elastically urging said heads into proximity with said striker means,

whereby the biasing means enables the blade edge to penetrate the wood to a predetermined depth before the striker means engages the heads of the toggle links to augment the splitting action of the blade edge.

4,372,361
MULTI-PURPOSE TURNING TOOL
Carl Whiteford, 3 High Point Rd., Westport, Conn. 06880
Filed May 19, 1980, Ser. No. 151,368
Int. Cl.³ B25G 1/00
U.S. Cl. 145—61 R 8 Claims



1. A multi-purpose turning tool comprising:

A. a handle adapted to be held in the hand of a user for simultaneously applying a longitudinal force and a turning force to the tool, said handle comprising

1. a gripping member adapted to be surrounded by the fingers and a portion of the palm of a user's hand for applying said turning force, said gripping member being generally elongate, and

2. a thrust plate rotatably connected to said gripping

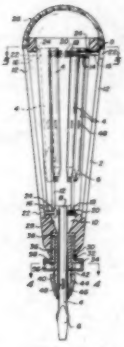
member in position to be pressed upon by the heel portion of the palm of the user's hand for applying said longitudinal force, said thrust plate being formed as a disc-like member rotatably connected to one end of said gripping member and including a plurality of tool bit storage compartments formed therein for holding excess tool bits, and

B. a shank connected to said gripping member for rotation with said gripping member, said shank being connected to the other end of said gripping member and having a socket at the free end thereof for receiving and holding one of a plurality of interchangeable tool bits.

4,372,362
TOOL

Min H. Ahn, 5111 Maple Rd., Richmond, British Columbia, Canada

Filed Feb. 23, 1981, Ser. No. 237,175
Int. Cl.³ B25G *1/08*
U.S. Cl. 145—63 **12 Claims**



1. A tool comprising a housing;
a plurality of bits located within the housing, each bit having a working end to protrude from the housing and an inner end located in the housing;
a pathway in each bit adjacent said inner end;
a first opening in the housing to allow a preselected bit to protrude;
means to grip the preselected bit;
a plurality of second openings, positioned circumferential of the housing and extending longitudinally of the housing;
a plurality of shafts, each extending through an associated second opening and through a pathway in a bit;
resilient means on each shaft urging each bit radially outwardly;
whereby a bit may be selected by pushing on its associated shaft and moving the shaft downwardly towards the first opening, the gripping means then being operated to grip the selected bit with its working end protruding from the first opening in the housing.

4,372,363
BAG CLOSURE

Robert H. Schmeling, 5431 Via Aquario, San Diego, Calif. 92111

Filed May 4, 1981, Ser. No. 260,244
Int. Cl.³ B65D *33/06, 33/30*
U.S. Cl. 150—4 **2 Claims**

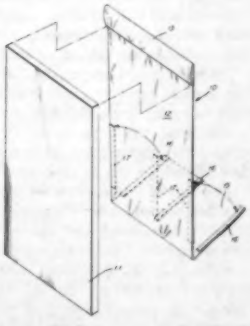
1. A bag enclosure comprising:
(a) a pair of bails hinged together at their ends to define a hinge axis and having a front side which defines the open mouth of a bag engaged thereon and a back side comprising the other side;
(b) one of the bails having a retainer extending therefrom which includes a component generally parallel to said axis, and the other of said bails having a detent which passes around the radial inside of said generally parallel component to be positively engaged on the back side thereof as said bails are closed, said bails being dimensioned and hinged to bias said detent outwardly as same rotates beneath and behind said retainer, whereby a bag having a flexible mouth engaged around said bail can be alternatively positively shut or open;
(c) said bails being resiliently hinged together in order to maintain contact between said detent and said retainer as the detent is moved relative to the retainer to lock or unlock the enclosure;

(d) said retainer and detent comprising loop handles extending from respective ones of said bails with the former being wider than the latter to permit the detent handle to pass through the retainer handle; and
(e) each of said handles defining a spanner bar which engages the other of said spanner bars when said closure is closed, and at least one of said spanner bars being bowed in the direction tangential to a rotational arc established around said axis and toward the other spanner bar, whereby said detent spanner bar passes through, up past, and over said retainer spanner bar against both radial and angular biasing to positively lock said handles together.

4,372,364
DOOR PROTECTOR

Edward R. Katz, 4847 Cambridge Dr., Dunwoody, Ga. 30338

Filed Nov. 9, 1981, Ser. No. 319,207
Int. Cl.³ E06B *7/28*
U.S. Cl. 150—52 R **8 Claims**



1. A door protector to prevent damage caused by contact with moving furniture or the like comprising a flexible padded body portion of sufficient size to cover one side of a door substantially from side-to-side and top-to-bottom, and pocket means carried by one end of said body portion and being engageable with the top edge portion of a door for the purpose

of suspending the protector on the door and positioning it laterally relative to the door.

4,372,365

SAFETY WHEELS

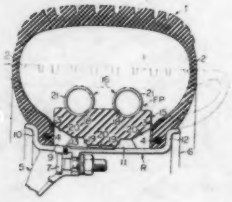
Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire and Rubber Co. Ltd. and Honda Giken Kogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 9,584, Feb. 5, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 168,342

Claims priority, application Japan, Mar. 14, 1978, 53-29438

Int. Cl.³ B60C *17/00, 5/00, 15/00*

U.S. Cl. 152—158 **3 Claims**



1. An improved safety wheel apparatus employing a split rim formed of at least two portions in an axial direction of the rim including two rim flanges and rim bases; a tubeless tire having bead portions and a ground-engaging tread portion being mounted on said rim, and a flat protector device incorporated into an air chamber surrounded by said tubeless tire and said split rim, said protector device serving to support said tubeless tire when air sealed within said tubeless tire is lost, the improvement wherein: said flat protector device comprises a flat protector seat portion annularly fitted at its radially inner surface along the outer peripheral surface of said split rim to hold said bead portions of said tubeless tire in cooperation with both rim flanges of said split rim, said flat protector seat portion being formed at its radially outer surface with at least two axially spaced apart annular grooves, said seat portion being defined by a web member formed of elastic material having joined end portions formed into an annular configuration, and at least two annular pipes of circular cross section formed independently of each other and free from mutual interaction, said pipes being annularly mounted in and held against axial movement by said annular grooves, spaced apart from the tread portion of said tire during the normal operation of said tire while being placed into supporting engagement with said tire tread portion, and free from engagement with the remaining portion of the tire during a puncture of said tire, each of said pipes having a pair of ends connected with each other by connector means, said connector means being engaged in an outer periphery of said seat portion, whereby said flat protector seat portion cooperates with said both rim flanges to strongly clamp the tire bead portions therebetween while said pipes act to support reactions transmitted from the road surface to the tire tread portion, said reactions being further transmitted from said tire tread portion to said rim bases through said flat protector seat portion so that said tire tread portion is supported by flat protector when air sealed within the tire is lost.

4,372,366

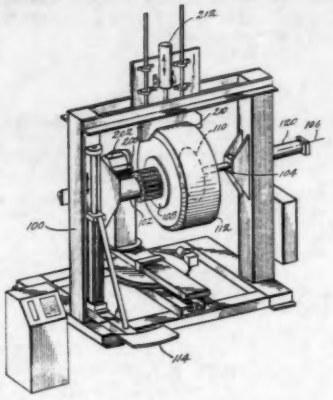
METHOD AND APPARATUS FOR NON-DESTRUCTIVE INSPECTION OF TIRES

Doyle L. Dugger, Muscatine, Iowa, assignor to Bandag Incorporated, Muscatine, Iowa

Division of Ser. No. 31,961, Apr. 19, 1979, Pat. No. 4,285,235. This application Feb. 12, 1981, Ser. No. 233,967

Int. Cl.³ B29H *21/08*

U.S. Cl. 157—13 **12 Claims**



1. Apparatus for buffing and for nondestructively testing a buffed tire carcass, said apparatus comprising:

opposing circular rings for sealingly engaging the corresponding rims of said tire,

tire inflation means for inflating said tire after engagement by said rings,

buffing means for rotating said inflated tire and for buffing away the outer tread wall surfaces to provide a substantially uniform outside tread wall surface on the resulting tire carcass,

ultrasonic testing means disposed both inside and outside said inflated tire for measuring the relative strengths of ultrasonic acoustic signals transmitted through different areas of said buffed tread wall as it is rotated thereby non-destructively testing the buffed tire carcass.

4,372,367

ROLLER BLINDS

Umberto Baldanello, 44 Via Meucci, and Giuseppe Zottino, 276, Via Roma, both of Spinea, Italy

Filed May 19, 1980, Ser. No. 151,287

Claims priority, application Italy, Jun. 12, 1979, 12637 A/79; Oct. 16, 1979, 84145 A/79

Int. Cl.³ A47G *5/02;* E06B *9/204*

U.S. Cl. 160—310 **5 Claims**

1. A drive mechanism for a winding roller upon which an element is to be wound, comprising:

(a) a motor gear holder disposed within said winding roller;

(b) a reversible electric drive motor disposed within said motor gear holder;

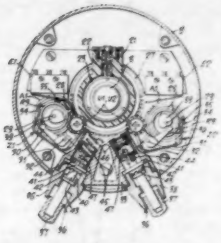
(c) reduction gear means drivably connecting said motor to said winding roller;

(d) a first limit switch actuable to switch off said drive motor in a rolled up position of said element wound on said winding roller, and a second limit switch actuable to switch off said drive motor in an unrolled position of said element wound on said winding roller;

(e) a first and a second control means associated respectively to the said first and second limit switches, each control means being gearably drivable by the winding roller to actuate the respective limit switch, wherein each control

means comprises a roll counting mechanism provided with at least two sequentially arranged counting rollers, the first counting roller being gearably connected with the winding roller, and the last counting roller presenting a limit switch actuator for actuating the respectively associated limit switch, and wherein the maximum length between the rolled up position and the unrolled position of said element wound on the winding roller corresponds to a angular rotation of said last counting roller of less than 360°;

(f) a stationary bearing housing provided at one end of said winding roller, inside which bearing housing there are disposed the said first and second limit switches and the said first and second control means; wherein said counting rollers of each roll counting mechanism are each provided with a heart-shaped zero-setting cam cooperable with a



zero-setting tappet and are movable relative to fixedly mounted transmission rollers and said zero-setting tappets by a manually operable adjusting device alternately to an inward position and an outward position, whereby in said inward position said counting rollers engage said transmission rollers, said first counting roller is in geared connection with said winding roller, said associated limit switch is actuable by said switch actuator of said last counting roller, and said zero-setting tappets are spaced from said associated zero-setting cams, and whereby in said outward position said counting rollers are spaced from said transmission rollers, said first counting roller is free of said winding roller, said associated limit switch is free from actuation by said switch actuator of said last counting roller, and said zero-setting tappets engage said associated zero-setting cams.

4,372,368

BLOCKING APPARATUS FOR FIXING A METAL BLOCK TO THE FINISHED FACE OF A SEMI-FINISHED SPECTACLE LENS BLANK

Gerard Lombard, Velaines, France, assignor to Essilor International (Compagnie Generale d'Optique), France

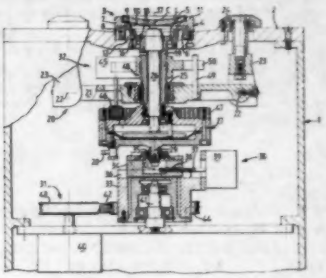
Filed Sep. 26, 1980, Ser. No. 191,130
Claims priority, application France, Sep. 26, 1979, 79 23922
Int. Cl.³ B22D *19/00*
U.S. Cl. 164—332 **17 Claims**

1. A blocking apparatus for fixing a metal block to the finished face of a semi-finished spectacle lens blank by casting low-melting metal into a mold contacting the finished face of the blank, which comprises:

(a) a housing,

(b) an open mold supported by said housing and having a fixed section and a movable section arranged for rotary contact with said fixed section, said fixed mold section having an annular seat for supporting a finished blank face and said movable section having relief elements adapted to form positioning reference means in said metal block and to define a system of three orthogonal axes, said system having a first axis coincident with a central axis of said annular seat in an initial position of said movable mold section, and a second axis adapted to be brought into exact alignment with a prescribed cylinder axis for a semi-finished lens blank, the fixed and movable mold sections contact having cooperating partially spherical surfaces defining a ball-joint connection having its center of rotation lying on said central axis of the annular seat, the movable mold section being rigidly attached to a shaft with the shaft having a longitudinal axis coincident with the central axis of said annular seat in the initial position of said movable mold section, said shaft extending along a direction remote from said annular seat,

(c) means associated with said housing for holding said lens blank on said annular seat,



(d) casting means associated with said housing for delivering molten low-melting metal into a cavity defined by said open mold through a casting duct formed in said mold,

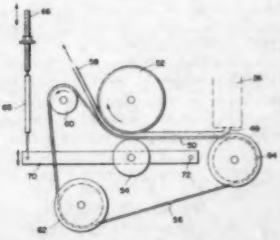
(e) control means operatively connected to said shaft for orienting and tipping the movable mold section about said center of rotation of said ball-joint connection in order to define a mold cavity for forming a metal block having a prescribed prism value and a prescribed orientation of the prism axis and to align said relief elements with the prescribed cylinder axis.

4,372,369

CONTINUOUS PROCESS FOR FORMING SHEET METAL FROM AN ALLOY CONTAINING NON-DENDRITIC PRIMARY SOLID

Merton C. Flemings, Cambridge, Mass., and Tooru Matsuuya, Kawasaki, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 19, 1980, Ser. No. 188,645
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—482 **5 Claims**



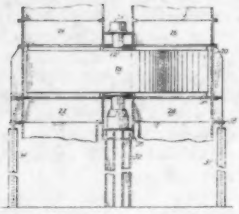
1. The method for shaping a homogeneous mixture of liquid-solid metal composition wherein said solid comprises discrete degenerate dendrites or nodules from a first metal composition which, when frozen from its liquid state, without agitation forms a dendritic structure, which comprises heating said first metal composition to melt said first metal composition in a first zone, passing the melted first metal composition into an agita-

tion zone connected to said first zone, vigorously agitating and cooling the melted first metal composition to solidify a portion thereof and to form primary solids comprising discrete degenerate dendrites or nodules while preventing the formation of interconnected dendritic networks in said agitation zone, said primary solid comprising up to about 80 weight percent of said liquid-solid metal composition, passing said liquid-solid metal composition from said agitation zone onto a belt which is moving relative to an outlet from said agitation zone, cooling the portion of said liquid-metal composition in contact with said belt to solidify a portion thereof, passing said partially solidified metal composition into a forming zone including a rotor that contacts said mixture wherein said partially solidified metal composition is formed under pressure and controlling the fraction solid of said mixture of liquid-solid metal, the deformation force in said forming zone and the rate at which said liquid-solid metal enters said forming zone in order to minimize intradendritic or intergranular cracks in the shaped composition while minimizing or preventing flow of said mixture outside of said forming zone.

4,372,370
ROTOR SUPPORT

Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,258
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—8 **4 Claims**



1. A rotary regenerative heat exchange apparatus having a rotor including an upright rotor post and a concentric rotor shell spaced therefrom to provide an annular space therebetween, a mass of heat absorbent material carried in the annular space between the rotor post and the rotor shell, a housing surrounding the rotor in spaced relation thereto, spaced ducts at opposite ends of the rotor adapted to provide inlet and outlet ducts for a heating fluid and for a fluid to be heated, a support bearing supporting the rotor post for rotation of the rotor post and concentric rotor shell about its vertical axis, means for rotating the rotor about is vertical axis, as support column adapted to carry the support bearing, and a plurality of support pedestals subjacent the housing, said support pedestals for the housing being structurally independent from the support column for the rotor whereby the rotor housing will effect a compressive force upon each pedestal independent from the compressive force of the rotor upon the support column thereby precluding sympathetic movement therebetween.

4,372,371
TRUNNION AIR SEAL

Roderick J. Baker, Belmont, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,567
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—9 **6 Claims**

1. Regenerative heat exchange apparatus including a rotor having a vertical rotor post, an upper trunnion integral with the rotor post extending upward therefrom, a lower trunnion extending down from the lower end of the rotor post, a rotor shell positioned concentrically around the rotor post adapted to provide an annular space for a mass of heat absorbent material, housing means surrounding the rotor including inlet and outlet openings for a heating fluid and for a fluid to be heated together with axially movable sector plates that direct the heating fluid and the fluid to be heated through the heat absorbent material of the rotor, a support bearing adapted to support the lower trunnion for rotation about its vertical axis, a guide bearing around the upper trunnion adapted to preclude lateral movement thereof, a first sealing means between the upper trunnion and the rotor housing adapted to preclude the flow of fluid therebetween, said sealing means comprising an annular

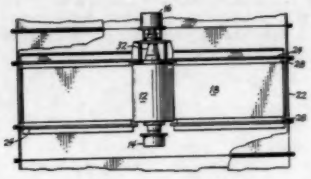
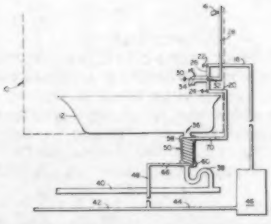


plate that concentrically surrounds the upper trunnion, an annular housing carried by said annular plate, said annular housing having an open side that confronts the trunnion to comprise an air seal that precludes fluid flow thereby, a source of pressurized sealing fluid, means for supplying the pressurized fluid to said air seal, spool means depending from said annular plate surrounding the trunnion and having a laterally extending rim that supports the radially inner end of an adjacent sector plate, and packing means carried by the rim of said spool means intermediate the sector plate and the spool means adapted to provide an independent sealing means that precludes the flow of heat and fluid from the rotor.

4,372,372
SHOWER BATH ECONOMIZER

Raymond Hunter, 2112 Ivy St., Chattanooga, Tenn. 37404

Filed Jan. 26, 1981, Ser. No. 228,331
Int. Cl.³ F24H *3/00*
U.S. Cl. 165—47 **8 Claims**



1. In a shower bath closet having cold and hot water supply means including a cold water pipe, a spent water drain, and a trap communicating said drain with a sewerage conduit, apparatus for preheating the cold water supplied by the cold water pipe to the water supply means to effect a reduction in the quantity of hot water necessary for a shower bath, said apparatus comprising: a heat exchanger including an elongated substantially cylindrical housing intermediate said drain and said trap, said housing having a spent water inlet at one end connected in flow communication with said drain and a spent water outlet at the opposite end connected in communication with said trap, whereby spent water exiting said drain flows through said heat exchanger prior to entry into said trap, at least one substantially cylindrical continuous helical coil having a central annulus within and extending substantially the

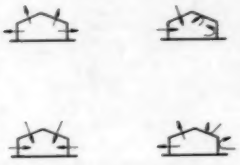
length of said housing, said coil being spaced within said housing to define an uninterrupted annular space extending the length of said coil to provide a linear flow path, a core disposed within the central annulus of said coil forming a baffle, said core including means for preventing flow of spent water through said central annulus and for directing the spent water into the uninterrupted annular space for passage of spent water over the surface of the coil and through the uninterrupted annular space, means connecting one end of said coil to said cold water pipe, and means connecting the other end of said coil to said cold water supply means.

4,372,373

CASING FOR BUILDING WORKS

Hans Haugeneder, Unterer Markt 8, A-3335 Weyer, and Erich Panzhauser, Gentzgasse 129, A -1180 Vienna, both of Austria

Filed Feb. 14, 1980, Ser. No. 121,577
Claims priority, application Austria, Feb. 15, 1979, 1192/79
Int. Cl.³ F24H *3/02*
U.S. Cl. 165—54 **33 Claims**



1. A system for air conditioning a building in either a cooling mode or in a heating mode, comprising:

means, including a layer of heat absorbing and heat exchanging material, permeable to air flow, forming a wall of said building, and

an outer casing arranged along said wall spaced from said layer for creating air flow through said layer controlled such that it is directed (a) during cooling mode operation from inside said building into the space between the wall and the outer casing, and (b) during heating mode operation from said space into the inside of said building,

a permeable inner lining arranged on the opposite side of the layer of heat absorbing and exchanging material from said outer casing and spaced from said heat absorbing and exchanging layer, and

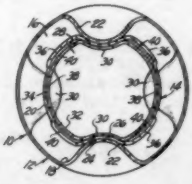
a heat storing layer located between said heat absorbing and heat exchanging layer and said outer casing.

4,372,374

VENTED HEAT TRANSFER TUBE ASSEMBLY

Marlow Lee, Clawson, Mich., assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 112,393, Jan. 15, 1980. This application Jul. 8, 1980, Ser. No. 166,957
Int. Cl.³ F28F *11/00*
U.S. Cl. 165—70 **18 Claims**



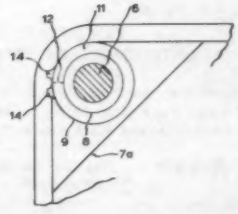
1. A vented heat transfer tube comprising a first tubular member having an interior wall surface, a second tubular member disposed within said first tubular member and having an exterior wall surface spaced apart from the interior wall surface of said first tubular member, and a plurality of projections each extending from said interior wall surface of said first tubular member and having an end engaged in a corresponding recess formed in said exterior wall surface of said second tubular member, said projections being diametrally disposed by pairs, wherein said second tubular member comprises a pair of tubular conduit members disposed one within the other, the exteriorly disposed conduit member being shrunk onto the interiorly disposed conduit member such as to provide said second tubular member with a double wall thickness, at least one continuous bulge formed in the wall of one of said conduit members causing a portion of said wall to be disposed spaced apart from the wall of the other of said conduit members for defining a channel extending from end to end of said second tubular member, and at least one opening to the ambient provided in said channel, wherein said bulge is formed in the wall of said exteriorly disposed conduit member.

4,372,375

HEAT EXCHANGER

Michael P. Bond, Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed Jul. 15, 1980, Ser. No. 169,132
Claims priority, application United Kingdom, Aug. 8, 1979, 7927611
Int. Cl.³ F28F *3/00*
U.S. Cl. 165—70 **4 Claims**



1. In a plate heat exchanger wherein adjacent plates forming the flow spaces for one heat exchange medium are welded together in pairs around the peripheries of the plates and around the through holes forming the ports carrying the other medium through the welded pairs of plates, whereas the flow spaces for the other medium are sealed by flexible gaskets: the improvement that the through holes forming the ports for the said one medium are sealed from the flow spaces for the other medium and from the ambient space by a duplex gasket arrangement with a sealed space between the gasketing.

4,372,376

HEAT PUMP APPARATUS

Paul A. Nelson, Wheaton, and Jeffrey S. Horowitz, Woodridge, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 9, 1980, Ser. No. 214,807
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.12 **8 Claims**

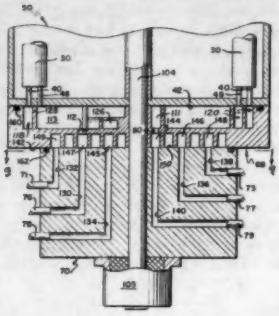
1. A heat pump apparatus comprising:

a housing

a plurality of metal hydride reactor beds supported by the housing with at least a portion of said beds being arranged in a pattern, each of the beds being operable by sequential treatment with a plurality of heat transfer fluids in a plurality of processing stages; and

valve means positioned adjacent said pattern of beds and including means for separating said beds of said pattern

into groups, each group for individual treatment in one of said processing stages, and means for simultaneously di-



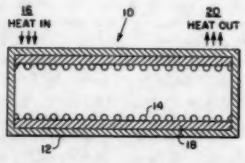
recting a plurality of said heat transfer fluids to said groups of beds so that a plurality of said processing stages are carried out simultaneously.

4,372,377

HEAT PIPES CONTAINING ALKALI METAL WORKING FLUID

James F. Morris, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 243,682
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.26 **4 Claims**



1. Apparatus for transferring heat from a source in a hot corrosive environment to a reciever remote from said source using a high temperature corrosive working fluid comprising

a container fabricated from a superalloy containing cobalt, nickel, chromium, tungsten, and iron extending from said heat source to said receiver,

capillary means (a wick) adjacent to the inner surface of said container,

a lithium (an alkali metal) working fluid in said container for transporting heat from the source end of said container to the reciever end of said container in a vapor state and returning from said receiver end to said source end through said capillary means in a liquid state, and

a corrosion inhibiting element selected from the group consisting of thorium, hafnium, lanthanum, and scandium alloyed with said superalloy to resist corrosion from both said hot corrosive environment of said source and said working fluid.

4,372,378

SHUT-IN DEVICE FOR STOPPING THE FLOW OF HIGH PRESSURE FLUIDS

Jerrold V. Powers, Jr., Albuquerque, N. Mex., assignor to The BDM Corporation, McLean, Va.

Filed Mar. 18, 1981, Ser. No. 245,150
Int. Cl.³ E21B *36/00*
U.S. Cl. 166—57 **35 Claims**

1. An apparatus for impeding the flow of an effluent through a path by forming a frozen plug of the effluent within the path, said apparatus comprising:

a. a tubular member located within the path of the effluent, said tubular member including a structural outer wall and an inner wall, said outer and inner walls being substantially cylindrical and concentric with each other, said outer and inner walls bounding a volume therebetween, said inner wall having an outer surface facing said outer wall and an inner surface opposite the outer surface, the path of the effluent being bounded by the inner surface of said inner wall;

b. means for circulating a refrigerated fluid through the volume bounded by said outer and inner walls for removing heat from said inner wall in order to cool effluent in heat-exchange contact therewith; and

c. a plurality of flow deflectors each having an end mounted to the inner surface of said inner wall, each of said flow deflectors extending substantially flush against the inner surface of said inner wall in a stowed position when refrigerated fluid is not being circulated through the volume bounded by said outer and inner walls, and each of said flow deflectors being responsive to the circulation of refrigerated fluid through the volume bounded by said outer and inner walls for being deployed to a position projecting away from the inner surface of said inner wall and into the path of the effluent for cooling the effluent and for providing support for the frozen plug of the effluent within said tubular member.

4,372,379

ROTARY DRIVE ASSEMBLY FOR DOWNHOLE ROTARY PUMP

Emanuel Kulhanek, and John Abounasfy, both of Edmonton, Canada, assignors to Corod Manufacturing Ltd., Nisku, Canada

Filed Oct. 6, 1981, Ser. No. 309,004
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—68.5 **4 Claims**

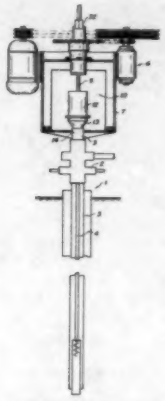
1. A rotary drive assembly, for use with a well assembly and a drive string to be suspended and rotated in the production string of the well assembly, comprising:

a frame connectable with the well assembly;

a spindle rotatably mounted on the frame, said spindle forming an axial bore through which the drive string may extend;

said spindle forming means for locking with a clamping means;

disengagable means for clamping on to the drive string, said



clamping means being adapted to seat on the spindle, whereby the drive string may be suspended from the spindle by the clamping means, said clamping means and locking means being adapted to interconnect the spindle and drive string for rotation together;

and means associated with the spindle for rotating the latter to thereby rotate the drive string.

4,372,380

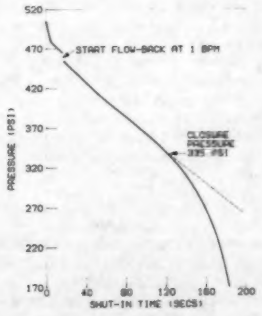
METHOD FOR DETERMINATION OF FRACTURE CLOSURE PRESSURE

Michael B. Smith, and Kenneth G. Nolte, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1981, Ser. No. 238,877

Int. Cl.³ E21B *47/06, 43/26*

U.S. Cl. 166—250 **6 Claims**



1. A method of determining the minimum in-situ stress of an underground formation penetrated by a well, comprising:

(a) injecting fluid at a certain rate into the formation to open fractures in the formation;

(b) backflowing the injected fluid at a rate less than the injection rate; and

(c) monitoring the well fluid pressure during step (b) to establish the pressure at which the fractures close.

4,372,381

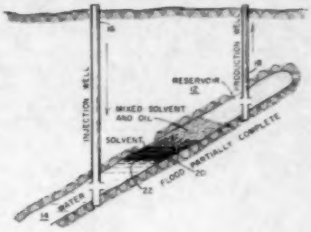
METHOD FOR RECOVERY OF OIL FROM TILTED RESERVOIRS

James M. McMillen, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 10, 1981, Ser. No. 253,120

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—263 **24 Claims**



1. A method for recovering oil from a subterranean oil reservoir penetrated by at least one injection well and at least one production well spaced apart in the reservoir, said reservoir having in one area an appreciable dip and having a water zone in fluid communication with and directly below an oil zone to form an oil-water interface, said method comprising the steps of:

(a) injecting a quantity of solvent for the oil into said reservoir via said injection well in the vicinity of said oil-water interface having a density less than the reservoir oil so as to contact the reservoir oil, finger upwardly into the oil, dissolve and lower said reservoir oil's viscosity;

(b) thereafter injecting water into the reservoir via said injection well to drive the solvent through the reservoir and adjusting the rate of the injection so that the interface between the solvent and the water is maintained in a substantially horizontal position to minimize fingering of the water into the solvent; and

(c) recovering oil from said production well.

4,372,382

METHOD AND SAMPLER FOR COLLECTING A NON-PRESSURIZED WELL FLUID SAMPLE

John F. Rooney, and Robert G. Pindell, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,742

Int. Cl.³ E21B *49/08*

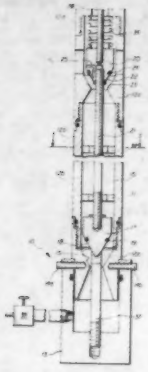
U.S. Cl. 166—264 **9 Claims**

1. A method for collecting a non-pressurized sample of fluid from a well in a sampler sample chamber having interconnected upper and lower valves in upper and lower ends of the same chamber to permit the pressure in the sample chamber to equalize with the ambient comprising the steps of,

(a) actuating upwardly both upper and lower valves of the sample chamber for opening and ease of purging of the sample chamber with submerging of the chamber in the well, and

(b) venting the sample fluid through a substantially vertical portion of a vent passage from the chamber to outside the sampler upon actuating both upper and lower valves downwardly substantially simultaneously for actuating

the valves and maintaining a true, representative sample of fluid in the sample chamber and to permit the pressure in



the sampler to equalize with the ambient for recovery at the surface.

4,372,383

IN SITU SEPARATION OF BITUMEN FROM BITUMEN-BEARING DEPOSITS

Robert K. Ames, Seattle, Wash., assignor to Reflux Limited, Seattle, Wash.

Continuation-in-part of Ser. No. 236,047, Feb. 19, 1981. This application Jun. 4, 1981, Ser. No. 270,261

Int. Cl.³ E21B *43/22, 43/40*

U.S. Cl. 166—266 **10 Claims**

1. A method for in situ removal of bitumen from a subterranean deposit comprising solid matter and bitumen, said bitumen in said deposit comprising greater than about 1% by weight of the total deposit, said method comprising the steps of:

injecting into said deposit a composition having an inverse critical solution (ICS) temperature in a two-phase system with water and being selected from a member of or mixtures of members of the groups of amines having the formula

wherein

R_1 is a hydrogen or an alkyl radical,

R_2 and R_3 are alkyl radicals having from 1 to 6 carbon atoms or alkenyl radicals having from 2 to 6 carbon atoms,

the total number of carbon atoms in the amine molecule being in the range of from 3 to 7, inclusive, said composition being present in an amount sufficient to dissolve substantially all of said bitumen in said deposit, said composition and said dissolved bitumen forming a mixture,

removing said mixture from said deposit, and thermally separating said mixture into a bitumen component and a composition component.

4,372,384

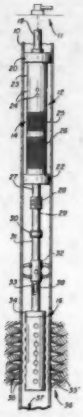
WELL COMPLETION METHOD AND APPARATUS

Charles W. Kinney, Houston, Tex., assignor to GEO Vann, Inc., Houston, Tex.

Filed Sep. 19, 1980, Ser. No. 188,813

Int. Cl.³ E21B *33/124, 43/04*

U.S. Cl. 166—278 **43 Claims**



38. A tool string suspended on a single pipe string within a cased borehole for completing a pay zone located downhole in a single trip, comprising:

a screen means suspended on the pipe string for screening the production from the pay zone;

perforating means suspended on the pipe string for perforating the cased borehole;

means for actuating said perforating means;

means suspended from said pipe string forming a gravel passageway for conducting gravel flowing down said pipe string into the cased borehole surrounding said screen means; and

means suspended from said pipe string forming a return passageway extending from said screen means to the surface.

42. Method of completing a well, comprising

lowering into a cased wellbore on a single string of tubing gravel packing means including screen means and perforating means,

perforating the well by actuating the perforating means,

flowing gravel down through the tubing string, through the gravel packing means and into the cased wellbore surrounding the screen means, and

flowing produced fluid from the perforations through the gravel, through the screen, and uphole to the surface of the ground.

4,372,385

METHOD OF PRETREATING AN UNDERGROUND FORMATION FOR SILICON POLYHALIDE CONSOLIDATION

David R. Davies, Rijswijk, Netherlands; Edwin A. Richardson, Houston, Tex., and Marinus Van Zanten, Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 161,239, Jun. 20, 1980, abandoned. This application May 14, 1981, Ser. No. 263,451

Claims priority, application United Kingdom, Dec. 17, 1979, 7943333

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—281 **3 Claims**

1. A process for increasing the rock strength of an imcompletely water-wetted gas-producing reservoir, which is suscep-

tible to impairment by water-blocking and is, or is likely to become, unconsolidated, comprising:

adjusting the water content in a portion of the resevoir to the extent necessary to provide a significant but small proportion of water within that portion;

injecting a pretreatment gaseous fluid which reacts with water to form a strong aqueous acid capable of increasing the water-wetness of the surfaces of the grains within the treated portion of the reservoir;

readjusting the water content of the treated portion of the reservoir to the extent necessary to ensure the presence of a significant but small proportion of water within the aqueous liquid which wets the grains; and,

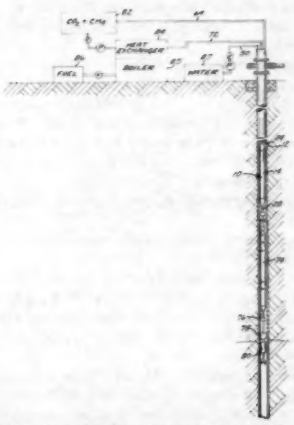
injecting a sand consolidating gaseous mixture of vaporous silicon polyhalide having a water reactivity at least substantially equivalent to that of silicon tetrachloride and substantially inert gas, in order to convert a significant proportion of the grain-wetting water to a rock-strengthening silica-gel, without an undue reduction in permeability.

4,372,386

STEAM INJECTION METHOD AND APPARATUS FOR RECOVERY OF OIL

Craig A. Rhoades, 9025 Wilshire Blvd., No. 215, Beverly Hills, Calif. 90211, and Thomas Meeks, 3656 Virginia Ave., Lynwood, Calif. 90262

Filed Feb. 20, 1981, Ser. No. 236,447
Int. Cl.³ E21B *43/24, 36/00*
U.S. Cl. 166—300 **15 Claims**



1. A method for generating heat to produce steam for injection into an oil bearing formation penetrated by a borehole, said method comprising:

selecting a working fluid from that class of fluids having first components adapted to undergo an endothermic first reaction upon subjection to reaction heat energy to form second components, wherein said second components are adapted to undergo a reverse, exothermic second reaction to form said first components and release substantially all of said reaction heat energy;

applying said reaction heat energy to said first components to form said second components;

conveying said second components down said borehole and inducing said second reaction to release substantially all of said reaction heat energy and form said first components;

conveying water down said borehole into heat exchange relation to said first components to cool said first components and utilize said reaction heat energy to convert said water to steam; and,

injecting said steam into said formation.

13. Apparatus for generating heat to produce steam for injection into an oil bearing formation penetrated by a borehole, said apparatus comprising:

methanation reaction means slidably insertable within said borehole and including a reactor portion having a methanation catalyst for catalytically promoting a methanation reaction of carbon monoxide and hydrogen to form carbon dioxide and methane, accompanied by the release of reaction heat energy, and further including a heat exchanger portion adapted to receive water and directly exposed to said reaction heat energy for conversion of said water into steam by said reaction heat energy including means for discharging said steam into said borehole, said means for discharging said steam being coupled to said heat exchanger portion;

reforming reactor means for surface location, and adapted to heat carbon dioxide and methane to reform carbon monoxide and hydrogen;

supply means for conveying carbon dioxide and methane to said reforming reaction means; and

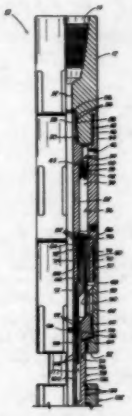
water supply means coupled to said heat exchanger portion.

4,372,387

DOWNHOLE TOOL WITH RATCHET

John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 57,093, Jul. 12, 1979, Pat. No. 4,246,964. This application Nov. 4, 1980, Ser. No. 204,057
Int. Cl.³ E21B *43/12*
U.S. Cl. 166—334 **3 Claims**



1. A downhole tool of the type, comprising:

first and second cylindrical body members;

an outer intermediate cylindrical member having a first end slidingly received within said first body member and a second end rotatingly received within said second body member;

an inner intermediate member telescopingly received within said outer intermediate member;

a ratchet means for moving said inner intermediate member longitudinally relative to said second cylindrical body member when said first cylindrical body member is rotated relative to said second cylindrical body member, said ratchet means including a plurality of ratchet blocks engaging said inner intermediate member, said ratchet blocks including radially inner ratchet threads engaging a threaded portion of said first cylindrical body member, said ratchet means further including resilient means for urging said ratchet blocks radially inward;

and

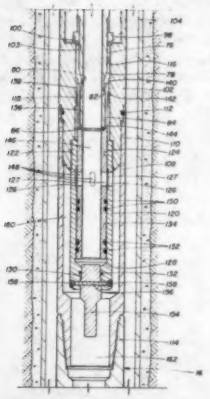
wherein said outer intermediate member includes a first cylindrical inner surface closely engaging radially outer surfaces of said ratchet blocks to maintain said radially inner ratchet threads of said ratchet blocks in engagement with said threaded portion of said first cylindrical body member, so that when said first cylindrical body member is rotated relative to said second cylindrical body member, said inner intermediate member is moved longitudinally relative to said second tubular body member so long as said radially outer surface of said ratchet blocks are closely engaged with said first cylindrical inner surface of said inner intermediate member.

4,372,388

SUBSURFACE CONTROL VALVE

Neal G. Skinner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 24, 1980, Ser. No. 209,621
Int. Cl.³ E21B *34/12*
U.S. Cl. 166—334 **8 Claims**



1. A subsurface control valve, comprising:

a stinger assembly including a substantially cylindrical housing having an axial bore therethrough, a first annular interior shoulder at the top of said housing bore, a second annular interior shoulder at the bottom of said housing bore, annular bearing means at the lower end of said housing, and first spline means between said first and second annular shoulders on the wall of said housing bore, said housing bore containing at its upper end a coil spring adapted to downwardly bias a stinger slidably mounted in said housing bore, said stinger having an axial bore therethrough, second spline means adapted to cooperate with said first spline means on said housing, exterior threads below said spline means, and valve engagement means at its lowest extent;

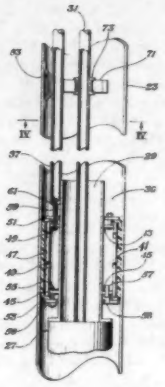
a valve assembly having upper, median, and lower communicating bores therein, threads in said upper valve assembly bore adapted to cooperate with said stinger threads, axially closable valve means including a slidable valve sleeve in said median valve assembly bore, spline means between said median valve assembly bore and said valve sleeve adapted to prevent rotational movement therebetween, and port means through the wall of said median valve assembly bore adapted to communicate between said upper and lower valve assembly bores when ports in said valve sleeve are aligned therewith.

4,372,389

DOWNHOLE WATER PUMP AND METHOD OF USE

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Franklin Heights, both of Va., assignors to Well-Pack Systems, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 803,525, Jun. 6, 1977, abandoned. This application May 23, 1979, Ser. No. 41,797
Int. Cl.³ E21B *33/127, 43/00*
U.S. Cl. 166—369 **13 Claims**



1. A system for pumping water from sub-surface formations to the surface through a cased borehole and a column pipe, comprising:

pump means located in the borehole and having lower inlet means and upper outlet means,

a column pipe coupled to said outlet means of said pump means and extending to the surface through the cased borehole for providing a flow path to the surface,

a drive shaft coupled to said pump means for operating said pump means,

said drive shaft extending to the surface through said column pipe,

power means located at the surface for rotating said drive shaft,

aperture means formed through the wall of said column pipe in the borehole relatively near said pump means for providing a flow path from said column pipe to the annulus between said column pipe and the cased wall of the borehole,

an annular inflatable packer adapted to engage the cased wall of the borehole when inflated, located in the borehole between said inlet means of said pump means and said aperture means formed through said column pipe,

means for use for inflating said packer,

means for deflating said packer

discharge means at the surface in fluid communication with said annulus and with said column pipe for discharging water from said annulus and from said column pipe.

4,372,390

WELL VALVE

John L. Baugh; James W. Montgomery, and Malcolm B. Roach, all of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Sep. 2, 1980, Ser. No. 183,128
Int. Cl.³ E21B *23/06, 34/12, 33/12*
U.S. Cl. 166—373 **19 Claims**

1. Apparatus comprising:

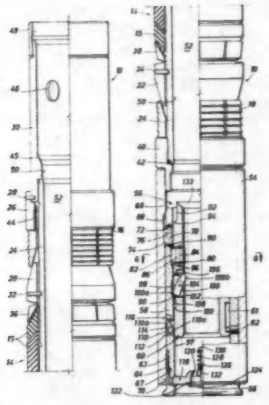
a. tubular body means, including first internal annular groove means;

b. first sleeve means for positioning generally within said tubular body means;

c. second sleeve means for positioning generally within said first sleeve means wherein said second sleeve means is selectively movable between a first longitudinal position relative to said first sleeve means and a second longitudinal position relative to said first sleeve means;

d. first anchor means mounted on said first sleeve means and selectively radially movable between an extended configuration, wherein said first anchor means may be received in said first groove means, and a retracted configuration, wherein said first anchor means may be withdrawn from said first groove means;

e. said second sleeve means including first surface means which is in registration with said first anchor means when said second sleeve means is in said first position, whereby said first surface means maintains said first anchor means in said extended configuration, and second surface means of lesser outer extent than said first surface means and which is in registration with said first anchor means when said second sleeve means is in said second position, whereby said first anchor means may move to said retracted configuration;



f. first latch means operable when said second sleeve means is in said first position relative to said first sleeve means for preventing movement of said second sleeve means out of said first position;

g. second latch means operable when said second sleeve mens is in said second position relative to said first sleeve means for maintaining said second sleeve means in said second position;

h. whereby said first and second sleeve means may be releasably held against longitudinal movement relative to said tubular body means with said first sleeve means positioned within said tubular body means, and said second sleeve means in said first position relative to said first sleeve means, such that said first surface means maintains said first anchor means in said extended configuration within said first groove means and said first latch means maintains said second sleeve means releasably fixed against longitudinal movement relative to said first sleeve means; and

i. transfer means for selectively disengaging said first latch means and moving said second sleeve means from said first position to said second position relative to said first sleeve means.

4,372,391

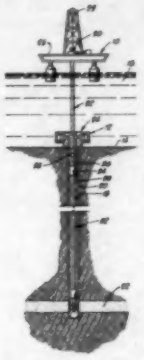
SCREW OPERATED EMERGENCY RELIEF AND SAFETY VALVE

Burchus Q. Barrington, Duncan, Okla.; Wilber P. Clayton, Aberdeen, Scotland, and Gerald D. Jackson, Marlow, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 7, 1980, Ser. No. 194,914

Int. Cl.³ C21B *34/12*

U.S. Cl. 166—373 **16 Claims**



1. A releasable valve apparatus, comprising:

a valve housing having a flow passage therethrough and adapted to be connected to a tubing string;

a flow valve means disposed in said valve housing for opening and closing said flow passage;

a stinger assembly adapted to be connected to said tubing string, said stinger assembly including a stinger mandrel telescopingly received within said valve housing;

an actuating mandrel assembly operably associated with said stinger mandrel and longitudinally movable within said valve housing between first and second positions corresponding to open and closed positions of said flow valve means;

releasable threaded connecting means for releasably interconnecting said valve housing and said stinger assembly; and

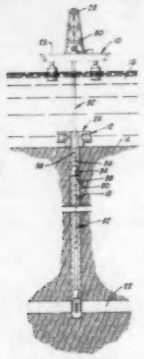
motion transfer means for translating rotational motion of said stinger assembly through a first predetermined number of rotations in a first rotational direction relative to said valve housing into longitudinal motion relative to both said stinger assembly and said valve housing of a lower portion of said actuating mandrel assembly connected to said flow valve means, said longitudinal motion being from a first position of said lower portion, corresponding to said first position of said actuating mandrel assembly and said open position of said flow valve means, to a second position of said lower portion, corresponding to said second position of said actuating mandrel assembly and said closed position of said flow valve means; wherein

said valve housing, flow valve means, stinger assembly, actuating mandrel assembly, releasable threaded connecting means, and motion transfer means are so arranged and constructed that, when disconnecting said releasable threaded connecting means, said first predetermined number of rotations of said stinger assembly in said first rotational direction relative to said valve housing causes said lower portion of said actuating mandrel assembly to move to its said second position thereby closing said flow valve means, and an additional predetermined number of rotations of said stinger assembly in said first rotational direction relative to said valve housing is necessary to release said stinger assembly from said valve housing.

4,372,392
FULL OPENING EMERGENCY RELIEF AND SAFETY VALVE

Burchus Q. Barrington, Duncan, Okla., and Wilbur P. Clayton, Aberdeen, Scotland, assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 7, 1980, Ser. No. 194,944
Int. Cl.³ E21B *34/12*
U.S. Cl. 166—373 **33 Claims**



1. A releasable valve apparatus, comprising:
a valve housing having a flow passage therethrough and adapted to be connected to a tubing string;
a full opening ball valve means disposed in said valve housing for opening and closing said flow passage;
a stinger assembly adapted to be connected to said tubing string, said stinger assembly including a stinger mandrel releasably telescopingly received within said valve housing and operably associated with said ball valve means for opening and closing said ball valve means in response to manipulation of said upper portion of said tubing string; and
releasable threaded connecting means for releasably interconnecting said valve housing and said stinger assembly; wherein
said valve housing, ball valve means, stinger assembly and releasable threaded connecting means are so arranged and constructed that, when disconnecting said releasable threaded connecting means, a first predetermined number of rotations of said stinger assembly in a first rotational direction relative to said valve housing is necessary to allow said ball valve means to close said flow passage and an additional predetermined number of rotations of said stinger assembly in said first rotational direction relative to said valve housing is necessary to release said stinger assembly from said valve housing.

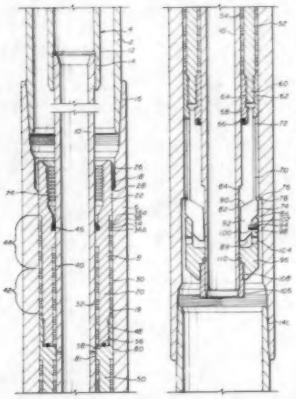
4,372,393
CASING BORE RECEPTACLE

John R. Baker, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 16, 1981, Ser. No. 273,805
Int. Cl.³ E21B *23/02, 33/129, 43/00*
U.S. Cl. 166—382 **32 Claims**

1. A sealing assembly for establishing sealing integrity in an annular area between a movable fluid transmission conduit and the casing of a subterranean well above a production zone, said assembly comprising:
a casing bore receptacle incorporable in said casing above said production zone, and comprising a casing receptacle sealing bore having a diameter less than the diameter of said casing;
a mandrel incorporable in said fluid transmission conduit;
an annular packoff member having inner and outer axially extending circumferential surfaces, said annular packoff member being insertable between said casing bore receptacle and said mandrel and being releasably carriable on said mandrel;
means on said annular packoff member comprising radially expandable latching means for engaging said casing bore receptacle to prevent movement of said annular packoff member relative to said casing bore receptacle in first and second opposite longitudinal directions;
disengagable means for attaching said annular packoff member to said mandrel and for releasing said annular packoff member from said mandrel after engagement of said annular packoff member with said casing bore receptacle to permit said mandrel to move relative to said annular packoff member in said first and second longitudinal direction said disengagable means comprising means for retaining said radially expandable latching means in a retracted position; and
inner and outer sealing means circumferentially extending along the inner and outer surface of said annular packoff member for establishing sealing integrity between said mandrel and said annular packoff member and between said casing receptacle sealing bore and said annular packoff member.

25. A method of producing fluids in a subterranean well



through a fluid transmission conduit insertable within an outer well casing, and for establishing sealing integrity in the annular area between said fluid transmission conduit and said casing and above said production zone, said method comprising the steps of:
incorporating a casing bore receptacle in said casing above said production zone;
incorporating a mandrel in said fluid transmission conduit with an annular packoff member releasably affixed to said mandrel, said annular packoff member having seals on the interior and exterior thereof;
inserting said fluid transmission conduit into said casing;
positioning said annular packoff member with said seals on the exterior thereof in contact with said casing bore receptacle;
engaging said annular packoff member with said casing bore receptacle to prevent longitudinal movement in a downward longitudinal direction;
increasing the pressure within the annulus between said fluid transmission conduit and said casing to increase the force acting on said annular packoff member in an upward direction;
moving said mandrel in an upward direction after increasing the pressure within said annulus to release said annular packoff member from said mandrel; and

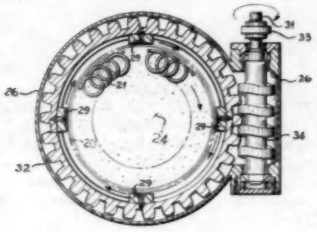
engaging said annular packoff member with said casing bore receptacle upon movement of said mandrel in a downward direction to prevent longitudinal movement of said annular packoff member relative to said casing bore receptacle in said upward direction with said seals on the interior of said annular packoff member maintaining sealing integrity as said mandrel moves therein.

4,372,394

MAGNETICALLY DRIVEN PULVERIZER

Theodore H. Allegri, Sr., McLean, Va.

Filed Dec. 22, 1980, Ser. No. 218,696
Int. Cl.³ A62C *11/00*
U.S. Cl. 169—30 **17 Claims**



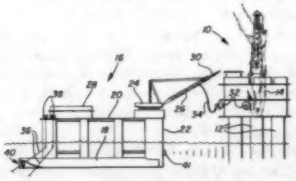
1. In combination with a fire extinguisher having a pressurized container including a throat portion at one end, and a nozzle assembly screwed into the throat portion, the improvement of a magnetically driven mixing means comprising a mixing element within said container adapted to be movable therein to mix the contents of the container in response to an externally generated magnetic field, means for generating said magnetic field, said means for generating said magnetic field including an annular ring member disposed about the container, said ring member being movable longitudinally relative to said container, said ring member having a plurality of horizontally spaced magnets affixed thereto and means for rotatably driving said annular ring member about said container.

4,372,395

STAB WATER SUPPLY SYSTEM

Dillard S. Hammett, Dallas, Tex., assignor to SEDCO, Inc., Dallas, Tex.

Continuation of Ser. No. 89,541, Oct. 29, 1979, abandoned. This application Nov. 9, 1981, Ser. No. 319,725
Int. Cl.³ A62C *13/24*
U.S. Cl. 169—69 **7 Claims**



1. A fire suppression system for use in controlling fires occurring on an offshore oil platform comprising:

pipe means on said platform for distributing fire suppressing fluid to locations throughout said platform;

at least one inlet for said pipe means which is accessible from the exterior of said platform;

a service vessel;

means for maintaining said service vessel at a predetermined station adjacent said platform;

a stab connector carried by said service vessel and adapted for connection to said inlet to establish a flow path for fire suppressing fluid from said service vessel to said pipe means;

a boom mounted on said service vessel and extendable therefrom towards said platform;

maneuverable support means at the outboard end of said boom supporting said stab connector;

control means on said service vessel at a position remote from said outboard end of said boom for operating said maneuverable support means whereby said stab connector can be inserted into said inlet; and

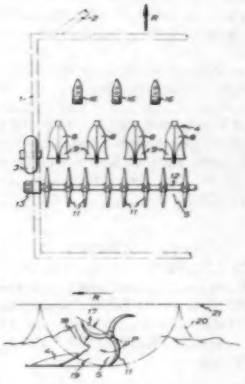
means on said service vessel for supplying a fire suppressing fluid under pressure to said stab connector, said means including a pump.

4,372,396

METHOD AND SYSTEM FOR CONTINUOUS TURN-OVER OF SOIL

Erik A. Westlund, Aby, Sweden, assignor to Wolter Konstruktion Erik Axel Westlund, Sweden

Continuation of Ser. No. 46,091, Jun. 6, 1979, abandoned. This application Apr. 30, 1981, Ser. No. 259,091
Claims priority, application Sweden, May 2, 1979, 7900969
Int. Cl.³ A01B *9/00, 79/00*
U.S. Cl. 172—1 **8 Claims**



1. Device for working the soil for agricultural purposes, comprising:

a frame which is displaceably carried by wheels and is adjustable to suitable height positions;

a plurality of prong means supported on said frame at forward, laterally-spaced positions for making vertical cuts in soil, each prong means being adapted to extend downwardly from the frame into the soil and being forwardly curved;

a plurality of plough means, carried by said frame at respective positions laterally spaced between and behind said prong means in the direction of displacement of the device, for making horizontal cuts in the soil and lifting it during displacement of the frame, each of said plough means includes a pointed front part and a rearwardly divergent part entending from said front part and situated in essentially the same horizontal plane as said front part, the divergent part being adapted for making horizontal cuts in the soil at the same depth as the vertical cuts made by the prong means, each plough means also includes upwardly curved guide surfaces arranged at the rear portion of said divergent part for lifting the cut soil to form a continuous soil strip; and

a plurality of rotor means, each in the form of a number of

planar radially extending curved vanes, said rotor means being rotatably supported on a shaft situated behind the plough means for engaging the lifted soil strip from below and essentially perpendicular to the soil strip so as to cut the soil strip transversely into segments substantially without mixing it, said rotor means further turning the segments over and depositing the segments behind the rotor means, one rotor means is arranged behind each of said guide surfaces, said rotor means form rows of aligned vanes forwardly curved in the direction of rotation and rotatable in a direction which is opposite to the rolling direction of the wheels, said rotation is at a rotational speed adjustable relative to the displacement speed of the device in such a way that the end portions of the vanes describe cycloidal paths having their lowest point on a level with the lowest portions of the divergent parts.

8. A method of working soil for agricultural purposes, comprising the steps of:

making generally vertical furrows in the soil with a number of prong means arranged in side-by-side relationship on a displaceable frame;

making generally horizontal furrows by plough means provided with cutting edges, said horizontal furrows being on a level generally corresponding to the bottom of the vertical furrows and being located in the soil between the vertical furrows;

carrying and lifting the soil that has been substantially detached from the sides of the vertical furrows and detached vertically from the horizontal furrows by means of upwardly curved guide surfaces associated with the plough means, so as to form a raised continuous strip of said soil; and

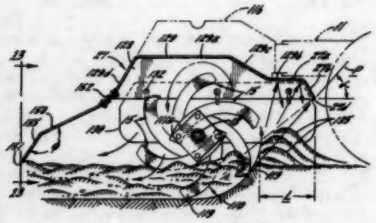
lifting and transversely cutting the continuous strip of soil into segments, and turning over and depositing the soil segments back on the ground, all with the aid of a plurality of rotor means each aligned with one of said guide surfaces and rotatable about a transverse shaft located behind said surfaces, each of said rotor means being provided with curved, thin vanes whose peripheries describe cycloidal paths.

4,372,397

GARDEN TILLER WITH EXTENDED TINE SHIELD

Gerold G. Goertzen, St. Anne, and Lee R. Herscher, Kankakee, both of Ill., assignors to Roper Corporation, Kankakee, Ill.

Filed Mar. 30, 1981, Ser. No. 248,872
Int. Cl.³ B62D 51/04; A01B 33/02
U.S. Cl. 172—42 **12 Claims**



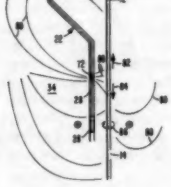
1. A walk-behind garden tiller comprising, in combination, a frame, ground-engaging drive wheels mounted adjacent one end of the frame, a tine drive shaft extending transversely to and journalled in a position adjacent to the other end of the frame, an engine mounted on said frame, a wheel drive train for coupling the engine to the drive wheels to drive the tiller in the forward direction, a rearwardly projecting handle secured to the frame for manual guidance of the tiller, a tine drive train for coupling the engine to the tine drive shaft, said tine drive shaft having a set of ground-engaging tines secured thereto, the tine drive train being so directioned that the tine shaft revolves counter to the direction of the drive wheels during tilling with the tines cutting upwardly through the untilled soil at the working face, a tine shield overlying said tines for confining flying and turbulent soil during tilling to the area about said tines, said tine shield including an extension located forwardly of said tines for blocking soil directed upwardly and forwardly by said counter-rotating tines and for defining an extended cavity in front of said tines within which a quantity of partially tilled soil can accumulate for re-working and more thorough pulverization by said tines as said machine proceeds forwardly, said tine shield extension extending forwardly of the front periphery of said tines a distance at least equal to about one-half the diameter of said tines, said tine shield extension extending downwardly to a level that is above the level of said tine drive shaft.

4,372,398

METHOD OF DETERMINING THE LOCATION OF A DEEP-WELL CASING BY MAGNETIC FIELD SENSING

Arthur F. Kuckes, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 4, 1980, Ser. No. 203,912
Int. Cl.³ E21B 7/04, 47/02; G01V 3/08, 3/26
U.S. Cl. 175—45 **8 Claims**



1. A method of locating a target borehole containing an electrically conductive material or object such as a casing, drill stem, or the like and for directing the drilling of a relief borehole to intersect the target borehole, comprising:

partially drilling a relief borehole at a location spaced from said target borehole;

lowering into said relief borehole at least one electrode adapted to inject current into the earth surrounding said relief borehole; connecting a source of low frequency current to said electrode, thereby producing a low frequency alternating electric current flow in the conductive material located in said target borehole, the current flow in said target borehole conductive material producing a target magnetic field;

measuring at selected depth intervals the magnitude, phase and direction of the target magnetic field produced within said relief borehole by the electric current flow in the conductive material in said target borehole;

measuring at said selected depth intervals the magnitude and direction of the earth's magnetic field;

determining from said target borehole magnetic field measurements and said earth's magnetic field measurements at each selected depth interval the compass direction and distance of said target borehole; and

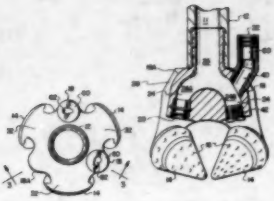
further drilling said relief borehole so that it intersects said target borehole at a selected depth below the earth's surface.

4,372,399

DRILL BIT WITH WEDGE SHAPED EDUCTION JETS

Michael S. Cork, Mesquite, Tex., assignor to Development Oil Tool Systems, Garland, Tex.

Filed Mar. 11, 1982, Ser. No. 357,066
Int. Cl.³ E21B 10/60
U.S. Cl. 175—65 8 Claims



1. In combination with a drill bit for connection to a torque and mud transmitting drill string, said drill bit being of the type having a main bit body with a mud conduit therethrough connectable to receive mud transmitted through the drill string; cutting means mounted on said main bit body; and at least one flushing jet through which said mud is expellable downwardly from said main bit body; the improvement comprising:

an eduction jet through which said mud received from said drill string is expellable upwardly from said main bit body; and

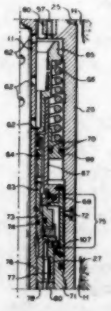
a nozzle at the explusion end of said eduction jet, said nozzle defining a substantially wedge shaped aperture through which said mud is expelled, said substantially wedge shaped aperture having an orientation which is tangential to the rotation of said drill bit and in which the narrower end of the substantially wedge shaped aperture leads in the rotation of the drill bit.

4,372,400

APPARATUS FOR APPLYING PRESSURE TO FLUID SEALS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 23,419, Mar. 23, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,707
Int. Cl.³ E21B 4/02
U.S. Cl. 175—107 11 Claims



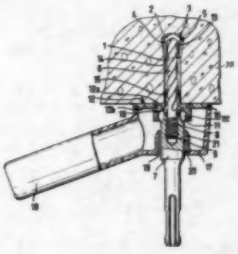
1. An apparatus for applying pressure to a fluid seal positioned between a reservoir of lubricating fluid and a stream of drilling fluid at a pressure value in a downhole drilling apparatus, comprising: a tubular spring retainer having a radially extending shoulder disposed generally at one end and circumferentially extending threads disposed generally at the other end, a tubular piston sleeve having a radially extending shoulder disposed generally at one end and circumferentially extending threads disposed generally at the other end, said spring retainer and said piston sleeve disposed in axial alignment, said threads of said spring retainer and said threads of said piston sleeve disposed in engaged relationship and said shoulder of said spring retainer and shoulder of said piston sleeve generally defining an annular cavity in fluid communication with said reservoir, an annular piston positioned in said cavity, said piston defining opposed circumferential grooves and including an axially extending collar having an outside diameter less than the diameter of said piston, an O-ring disposed in each of said circumferential grooves, and spring means disposed between said shoulder of said spring retainer and said piston for moving said piston in a direction to increase the pressure of the lubricating fluid to a value which exceeds said pressure value.

4,372,401

DRILL TOOL

Artur Fischer, Weinhalde 34, D-7244 Tumlingen/Waldachtal, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,514
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027408
Int. Cl.³ E21C 7/00
U.S. Cl. 175—209 10 Claims



1. A tool for drilling holes with undercut enlarged portions in a support structure, comprising an enlongated drill shank having an axis of rotation, a drill bit at one end of said drill shank and having cutting edges extended radially outwardly of said drill shank; a drill collet at the other end of said drill shank, said drill collet being provided with a stop collar being of a substantially semispherical configuration; a stop plate being formed with a recess supporting said stop collar and being shaped so as to matingly complement the configuration of said stop collar thus forming therewith a swivel bearing; said drill shank being screwed into said drill collet; and a drill bell connectable to said stop plate and having a central through bore to receive said drill collet, said cutting edges being operative for forming a cylindrical hole in said support structure when the tool is axially advanced within said structure and for forming an enlarged undercut portion of the hole when a swiveling movement is imparted to the tool.

4,372,402

COMBINATION FLUID NOZZLE AND BACKFLOW VALVE

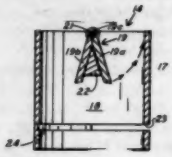
Joe Trevino, Jr., Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Oct. 21, 1981, Ser. No. 313,527
Int. Cl.³ E21B 10/18
U.S. Cl. 175—318 5 Claims

1. A nozzle valve assembly for use in a nozzle recess in a rock drilling bit having internal, pressurized-fluid supply passages, said nozzle assembly comprising;

(a) a generally cylindrical hollow nozzle body adapted for relatively close fitting engagement in the nozzle recess of a rock drilling bit and having open axial ends;

(b) a backflow valve assembly mounted adjacent one end of said nozzle body to allow fluid to flow in only one direction through said nozzle body; and



(c) a semicircular radial slot formed through the sidewall of said cylindrical nozzle body; and

(d) an orifice plate having a nozzle opening formed centrally therethrough, said plate being configured for insertion through said slot for secure retention within said body so that all of the fluid flowing through said body passes through said nozzle opening.

4,372,403

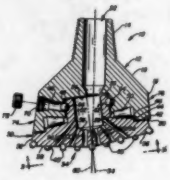
ECCENTRIC ROTARY BIT

Archie W. Beeman, 501 Hillcrest, Odessa, Tex. 79760

Filed Sep. 14, 1981, Ser. No. 301,766

Int. Cl.³ E21B *10/08*

U.S. Cl. 175—343 **6 Claims**



4. A rotary drill bit having a rotatable upper body member, an axial passageway formed through the upper end of the upper member, a downwardly opening chamber formed at the lower end of said upper member which downwardly opens along a centerline which is arranged at an angle respective to the centerline of the axial passageway;

a bearing race in the form of a circumferentially extending shoulder arranged perpendicular respective to the centerline of the chamber;

a non-rotatable lower bit member having a formation engaging face formed thereon for engaging a formation, said bit member includes a cylinder arranged perpendicular respective to said formation engaging face;

an upwardly opening cavity within said cylinder; a bearing race circumferentially disposed about said cylinder and arranged perpendicular to said cavity; fastener means for capturing said lower bit member to said upper member in low friction relationship therewith so that the upper member can be rotated respective to the lower bit member;

a flow passageway means extending from said axial passageway, through said cylinder, and through the face of the lower bit member through which fluid can circulate;

said cutting face is in the form of an inverted cone, said cone includes a ground engaging side and an elevated opposed side, said elevated side of the cone lies parallel to said inclined plane;

said hollow cylinder is in communication with said axial passageway and with said plurality of passageways.

4,372,404

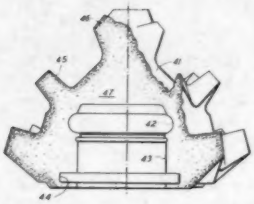
CUTTING TEETH FOR ROLLING CUTTER DRILL BIT

Eric F. Drake, Pearland, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Sep. 10, 1980, Ser. No. 185,691

Int. Cl.³ E21B *10/08, 10/46*

U.S. Cl. 175—374 **18 Claims**



1. A cutting element for attachment to a rolling cutter which is rotatably mounted on a drill bit,

said cutting element comprising:

a root portion adapted for engagement in a bit cutter; and,

a cutting portion on said root portion adapted to protrude from a bit cutter in a cutting orientation;

wherein said cutting element comprises a portion of substantial thickness comprising a densified powder metallurgical composite of at least two varying phases, said composite having a substantially continuous mechanical property gradient through said cutting portion.

4,372,405

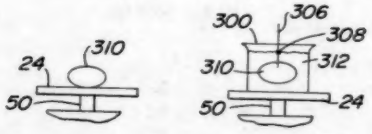
WEIGHT, VOLUME OR DENSITY MEASURING SYSTEM

James M. Stuart, 2074 Yellow Springs Rd., Malvern, Pa. 19355

Filed Feb. 11, 1981, Ser. No. 233,525

Int. Cl.³ G01G *19/04, 5/02, 3/14*; **G01N** *9/00*

U.S. Cl. 177—25 **17 Claims**



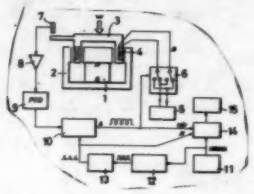
1. Scientific apparatus for automatically determining either the weight, volume or density of an unknown solid or liquid material comprising a housing including scale means having a housing including a platform for receipt of said unknown material thereon and for measuring the weight of said material, computing means, display means, variable capacitance means coupled to said platform and to said computing means and means for compensating for variations in said variable capacitance means caused by temperature variations or changes in the dielectric of said capacitance means caused by changes in the ambient atmosphere, said computing means including memory means, calculating means and control means, said memory means being coupled to the calculating means and the control means for automatically calculating the density of said material, whereupon said display means displays said calculated density.

4,372,406

ELECTRONIC BALANCE

Akira Komoto, Otsushi, and Tomohiro Tsuji, Ujishi, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Apr. 28, 1981, Ser. No. 258,512
Claims priority, application Japan, Apr. 30, 1980, 55-58388; Jul. 15, 1980, 55-97319
Int. Cl.³ G01G 7/02
U.S. Cl. 177—212 9 Claims



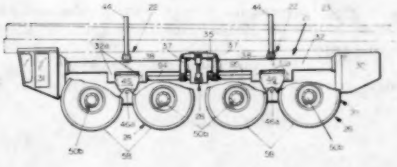
1. An electronic balance comprising:
a fixed portion including a permanent magnet and a magnetic circuit;
a movable portion displacing in response to a load applied thereto;
a coil for inducing a magnetic force defying said load;
means for supplying a current to said coil at given time intervals alternately in the positive and negative directions;
a detector for detecting any displacement of said movable portion;
a feedback controller for controlling said current supply means by the output signals from said detector, whereby the measured value is obtained by subtracting the product of the current I_2 in the negative direction and a time fraction t_2 for which the same flows from the product of the current I_1 in the positive direction and a time fraction t_1 for which the same flows, wherein the sum of said time fraction t_1 and t_2 are equal to each of said time intervals.

4,372,407

INDEPENDENT STEERING AND PROPULSION SYSTEM FOR OFF ROAD VEHICLE

Bruce J. McColl, Whitby, Canada, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 934,457, Aug. 17, 1978, Pat. No. 4,237,994.
This application Jun. 20, 1980, Ser. No. 161,981
Int. Cl.³ B62D 61/10; B60G 19/10; B62D 5/04, 9/00
U.S. Cl. 180—6.2 7 Claims



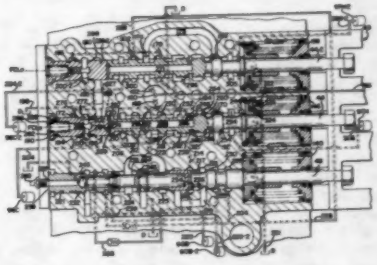
1. The method of moving a multi-wheeled roadless terrain vehicle of the type having at least two quadwheel supporting assemblages, means for driving each wheel, an individual steering means for turning each wheel about a radius on the order of three feet, and an individual brake for each wheel, under terrain conditions wherein movements of the vehicle by wheel traction is impossible, comprising the steps of:
(1) locking each wheel against rotation by application of the brake thereto;
(2) turning all wheels on one side in the same direction relative to the vehicle, and concurrently turning all wheels on the other side in the opposite direction; and
(3) releasing the brake on selected ones of said wheels and repositioning said wheels to longitudinally shift the body of the vehicle relative to the ground.

4,372,408

CLUTCH-CLUTCH-BRAKE STEERING MECHANISM FOR TRACTORS

Probir K. Chatterjea, Mt. Prospect, Ill., assignor to International Harvester Co., Chicago, Ill.

Continuation of Ser. No. 951,690, Oct. 16, 1978, abandoned.
This application Aug. 11, 1980, Ser. No. 176,815
Int. Cl.³ B62D 11/008; B60K 41/024
U.S. Cl. 180—6.2 19 Claims

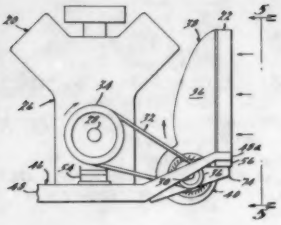


1. Transmission mechanism comprising a multi-ratio drive and braking train (38,38-2) having devices comprising at least one spring applied braking device and two drive devices, each drive device hydraulically disposed so as to be separately hydraulically paired with the braking device,
a modulator valve (44-2) for modulating the output supplied by an operating fluid pressure source of operating fluid under pressure, having restricted common pressure ports (174, 200-2) common to the braking device and to different ones of those drive devices each of which is separately paired with the braking device, said modulator valve operable to selectively connect said operating fluid pressure source alternately to each such common pressure port;
plural springs comprising one plurality of springs of one strength operative in the braking device (90B-2) for brake application and operatively overcome by the force of the operating fluid pressure for braking pressure neutralization and, thereupon, for filling the braking device and causing the springs to yield for complete brake release; and
another plurality of the springs of one strength operative in the drive devices (96C-2, 97H-2) for drive disengagement and operatively overcome by the force of the operating fluid pressure for filling the drive devices and causing the springs of the latter to yield for initiating drive engagement;
there being stronger springs in the spring-applied braking device (90B-2) than in each fluid-engaged drive device paired therewith so that filling of each of the latter (96C-2, 97H-2) and initiation of its engagement always precedes filling of the paired braking device through their respective port common therewith, thus inherently affording a cushioned drive engagement once initiated, due to the delay time required for fluid to flow through such common port.

4,372,409
CROSS-FLOW FAN FOR TRANSVERSE ENGINE VEHICLE

Joseph S. Mazur, Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 28, 1980, Ser. No. 172,882
Int. Cl.³ B60H *1/024*
U.S. Cl. 180—54 A 8 Claims



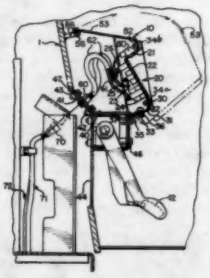
1. In a vehicle of the type including a forwardly mounted engine having a crankshaft mounted therein for rotation about an axis transverse to the longitudinal axis of the vehicle; a liquid cooling system for the engine having a radiator spaced forwardly of the engine with respect to the longitudinal axis and in a plane substantially parallel to the crankshaft axis with the air discharge side of the radiator facing the engine; a cooling fan for directing air through the radiator; means mounting the fan for rotation about an axis substantially parallel to and between the crankshaft axis and the plane of the radiator; and mechanical drive means for rotating the fan in response to rotation of the crankshaft; the improvement comprising:

a cross-flow fan defining the cooling fan, said fan having an outer circumferential extent defined by a plurality of blades circumferentially arrayed about the fan axis, said blades having a radial extent extending generally inward toward the fan axis of the fan, and said blades operative in response to rotation about the fan axis to pump the cooling air chordally across said circumferential extent in planes transverse to the axes of said fan and said crankshaft.

4,372,410
MODULAR INSTRUMENT CONSOLE

Arlin D. Loken, and Leroy Luebkemann, both of Springfield, Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 10, 1980, Ser. No. 205,787
Int. Cl.³ B62D *23/00*
U.S. Cl. 180—89.12 11 Claims



1. An instrument console for alternate mounting in combination with a vehicle comprising

panel means having a plurality of instrument means operatively coupled to respective output signals reflective of functional operation of the vehicle,

enclosure means coupled to said panel means to enclose said plurality of instrument means and permit viewing operation of said instrument means,

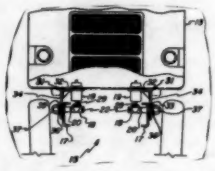
temporary attachment means for temporarily affixing said enclosure means to the vehicle prior to permanent installation of said enclosure means in an operator compartment of the vehicle, said instrument means being adapted to be operatively coupled to the vehicle output signals during said temporary attachment, and

permanent attachment means for permanently affixing said enclosure means within the operator's compartment after said operator's compartment has been installed on the vehicle.

4,372,411
TRUCK CAB TILT MECHANISM

Wallace C. Flower, McKean, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jun. 15, 1981, Ser. No. 274,043
Int. Cl.³ B62D *23/00*
U.S. Cl. 180—89.15 14 Claims

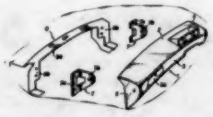


1. In a cab-over-engine truck having a cab and frame, a suspension system disposed therebetween to isolate vibration transmitted from said frame to said cab, and lift cylinder means operable to tilt said cab upwardly from said frame during a tilting operation, the improvement comprising a tilt-assist mechanism including load carrying means disposed at either side of said truck, each of said load carrying means being formed with a slot, a pair of pivot means mounted to either side of said frame and extending through said slots in respective ones of said load carrying means, and confining means mounted adjacent respective ones of said load carrying means, said confining means being operable to releasably secure said pivot means at a fixed position along said slot thus forming a fixed pivot point at each of said load carrying means, whereby upon actuation of said lift cylinder means said cab rotates about said fixed pivot points with the forces produced by the weight of said cab being reacted through said tilt assist mechanism.

4,372,412
VEHICLE INSTRUMENT PANEL ATTACHING STRUCTURE

Takayuki Fujii, Oimachi, and Hitoshi Suda, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 216,939
Claims priority, application Japan, Dec. 17, 1979, 54-174452[U]
Int. Cl.³ B60K *20/08*
U.S. Cl. 180—90 8 Claims



1. In a vehicle including a body frame, an instrument panel comprising:

an attaching structure which yieldably connects said instrument panel with a portion of said body frame;

said attaching structure including at least one yieldable stay disposed at each side end portion of said instrument panel, each said stay being connected between said instrument panel and said body frame portion such that a predetermined clearance is defined between said instrument panel and said body frame portion; and

each said stay being yieldably movable in substantially the transverse direction of said vehicle when said instrument panel is subjected to a substantial impact force, such that said substantial impact force is absorbed by said substantially transverse yielding movement of each said stay.

4,372,413

HYDROSTATIC STEERING DEVICE

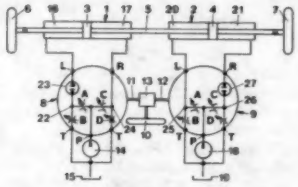
Hans C. Petersen, Nordborg; Erik Kyster, Augustenborg; Svend E. Thomsen, Nordborg, and Carl O. Flagstad, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 5, 1980, Ser. No. 204,180

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944883; Dec. 28, 1979, 2952674

Int. Cl.³ B62D 5/08

U.S. Cl. 180—152 **4 Claims**



1. A hydraulic steering control system comprising a bidirectional servomotor having two operating ports on opposite sides thereof; pump and tank means; manually operable steering control means; a metering control unit having a housing, shaft means connected to said steering control means journaled in said housing, metering motor means in said housing, first and second relatively rotatable valve means connected respectively to said shaft means and said metering motor means, spring means between said first and second valve means, said housing and valve means having supply port means connected to said pump means and first and second exhaust port means connected to said tank means, said housing and valve means having first and second control port means connected to said servomotor operating ports, flow path means including first and second supply branches having fluid communication with said supply port means, said flow path means including (1) first control and exhaust branches connected to said first supply branch and respectively to said first control and exhaust port means and (2) second control and exhaust branches connected to said second supply branch and respectively to said second control and exhaust port means, said metering motor means being in one of said control branches, throttling valve means in said flow path means between said first and second relatively rotatable valve means including a first pair in said first supply and second exhaust branches and a second pair in said second supply and first exhaust branches, said first and second pairs of throttle valve means acting oppositely from partially closed neutral positions towards fully opened or fully closed positions in response to the turning of said shaft in one direction or the other.

4. A hydraulic steering control system according to claim 1 including a second bidirectional servomotor having two operating ports on opposite side thereof, said first named and said second servomotor having common shaft means, a second metering control unit the same as said first named metering control unit in the stated respects, said steering control means being connected to the corresponding said shaft means of said second metering control unit for rotation thereof in the opposite direction, said second metering control unit having its corresponding said supply port connected to said pump means and its corresponding first and second exhaust port means connected to said tank means, said second metering control unit having its corresponding first and second control port means connected to said operating ports of said second servomotor, said metering motor means of said first named metering control unit being in said first control branch thereof and the corresponding metering motor means of said second metering control unit being in the corresponding second control branch thereof so that said metering motor means always act jointly and oppositely in metering fluid supplied to and exhausted from said first named and said second servomotors.

4,372,414

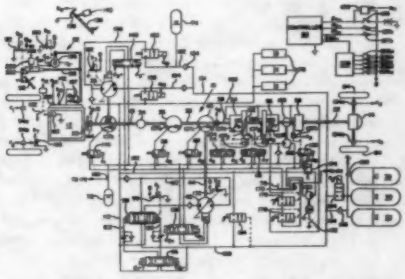
FUEL-EFFICIENT ENERGY STORAGE AUTOMOTIVE DRIVE SYSTEM

David H. Anderson, Portland, and Eugene F. Lucas, Lake Oswego, both of Oreg., assignors to Advanced Energy Systems, Inc., Portland, Oreg.

Filed Sep. 4, 1980, Ser. No. 184,149

Int. Cl.³ B60K 9/000

U.S. Cl. 180—165 **9 Claims**



1. In a wheeled vehicle having first and second wheels and an engine, a vehicle drive system comprising:

(a) energy storage means for collecting and storing energy;

(b) power transmission means mechanically coupled to said first wheel, but not said second wheel, of said vehicle for applying torque to said first wheel but not said second wheel;

(c) transmission control means for selectively connecting said power transmission means to said energy storage means for causing said power transmission means to transfer energy between said storage means and said first wheel;

(d) said power transmission means comprising variable torque application means for controllably applying varying amounts of torque to said first wheel while transferring energy between said storage means and said first wheel;

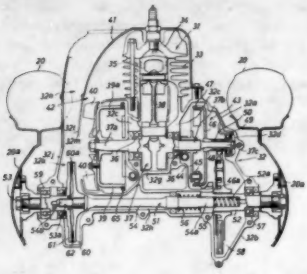
(e) wheel speed sensor means for sensing and comparing the respective rotational speeds of said first and second wheels; and

(f) means connected to said variable torque application means and to said wheel speed sensor means for causing said torque application means to reduce the amount of torque applied to said first wheel automatically in response to a difference between the rotational speeds of said first and second wheels of at least a predetermined minimum magnitude.

4,372,415
VEHICLE DRIVE UNIT

Masaki Watanabe, Urawa, and Goroei Wakatsuki, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,603
Claims priority, application Japan, Apr. 10, 1979, 54-43552; Apr. 20, 1979, 54-52999[U]
Int. Cl.³ B60K 5/04
U.S. Cl. 180—215 **9 Claims**



1. A drive unit for a vehicle having two spaced apart drive wheels, comprising:

an engine having a crankshaft operably connected therewith, said crankshaft having at least one end extending on one side of said engine, said end of said crankshaft being operably connected with a transmission mechanism;

an axle having said drive wheels respectively supported on the ends thereof, said axle including an intermediate member and first and second drive members mounted respectively on ends of said intermediate member in alignment therewith;

a final output gear operably connected with said transmission mechanism and mounted on said first drive member of said axle so as to rotate said first drive member by power of said engine supplied through said crankshaft and said transmission mechanism;

said intermediate member of said axle being connected with said first drive member so as to rotate together therewith;

power transmitting means mounted on said second drive member, said power transmitting means including coupling means for coupling said second drive member with said intermediate member so as to rotate said second drive member upon rotation of said intermediate member; and

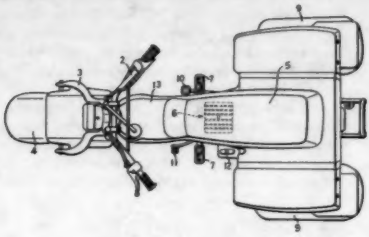
said engine being disposed between said final output gear and said power transmitting means.

4,372,416
TRICYCLE VEHICLE

Nihaku Igarashi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 5, 1980, Ser. No. 184,652
Claims priority, application Japan, Sep. 14, 1979, 54-118087
Int. Cl.³ B62J 25/00
U.S. Cl. 180—215 **1 Claim**

1. In a tricycle vehicle of the type which has a body, a forward wheel mounted to a steering post, two rear wheels, an engine forwardly of the axis of said rear wheels drivingly engaged to said rear wheels, a foot rest projecting from each side of the body, and a seat for the driver, the improvement comprising extending said seat substantially forward of said foot rests, and locating the crankcase of said engine rearwardly of said foot rest, said seat having a seat surface extending for a substantial distance along and upon which the driver can stably rest at a plurality of locations, with his feet on the foot rests, in a posture resembling the rider of a horse, without impediment by the steering post, there being a sufficient vertical spacing

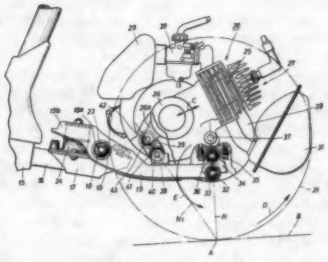


between the seat and the footrests to accommodate for such a posture.

4,372,417
DRIVE UNIT MOUNTING STRUCTURE

Hitoshi Yamamoto, Shiki; Masaki Watanabe, Urawa, and Nobuhiro Shido, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1980, Ser. No. 198,350
Claims priority, application Japan, Oct. 22, 1979, 54-136224
Int. Cl.³ B62K 5/04
U.S. Cl. 180—215 **7 Claims**



1. A drive unit mounting structure, comprising:

a body of a vehicle;

a rear fork pivotably connected at one end thereof to said body;

a drive unit pivotably mounted at a rear portion thereof on the other end of said rear fork;

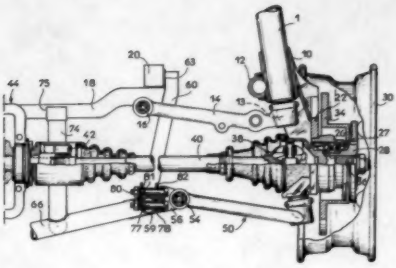
a rear wheel drivably coupled to said drive unit; and

first link means having one end pivotably connected to a front portion of said drive unit and the other end pivotably connected to said rear fork, one of said pivotably connected ends of said first link means being disposed forwardly and upwardly of the other of said pivotably connected ends in the normal state of equilibrium of said mounting structure, such that said link means has a longitudinal axis directed obliquely, when viewed in side elevation, toward a point where said rear wheel contacts the ground.

4,372,418
FRONT SET OF WHEELS FOR AN AUTOMOBILE VEHICLE

Henry L. A. Dangel, 7 Rue du Sillon, 68100 Mulhouse, France, assignor to Henry Leon Albert Dangel, Mulhouse, France

Filed Sep. 8, 1980, Ser. No. 185,099
Claims priority, application France, Sep. 13, 1979, 79 22854
Int. Cl.³ B60K *17/30*
U.S. Cl. 180—256 10 Claims

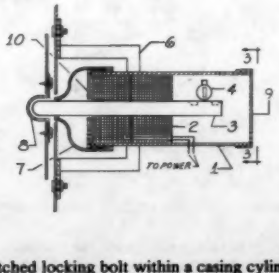


1. A front set of vehicle wheels comprising in combination, for each wheel of the set, a wheel hub support, an upper suspension arm, a suspension arm located below the upper arm and shorter than the upper arm, a telescopic shock absorber-suspension spring assembly having an axis of telescopic operation and fixed to the hub support at a lower end of the shock absorber-suspension spring assembly, means for connecting an upper end of the shock absorber-suspension spring assembly to the vehicle, a ball joint articulation connecting the telescopic shock absorber-suspension spring assembly to the upper suspension arm, and a second ball joint articulation connecting the hub support to the lower suspension arm, the two ball joint articulations having centres which are in fixed alignment on said axis of the shock absorber-suspension spring assembly and pivotal means provided adjacent to ends of the suspension arms opposed to said ball joint articulations for pivotally mounting the arms on the vehicle, said pivotal means of at least one of the arms being sufficiently elastically yieldable in operation of the arms for accommodating the fact that one of said ball joint articulations does not travel on an arc of a circle.

4,372,419
VEHICULAR ANTI-THEFT LOCKING SYSTEM

Lawrence Barnett, 75-34 168 St., Flushing, N.Y. 11366; Julio Cordoba, 21 Crosby Ave., Brooklyn, N.Y. 11207, and Benjamin Nuzzo, 142 Fountain Ave., Selden, N.Y. 11784

Filed Feb. 19, 1980, Ser. No. 122,028
Int. Cl.³ B60R *25/00*
U.S. Cl. 180—289 2 Claims



1. A notched locking bolt within a casing cylinder mounted in a vehicle door and a manual disengaging apparatus, said locking bolt passing through a dual polarity electromagnetic coil, through a front casing cap and insulated bushing, through a hole in said vehicle door side wall, and into a receptacle that covers a hole in a door post of said vehicle;

said casing cylinder having removable front and rear casing caps;

said insulated bushing, which is attached to the outside of said casing cylinder and said front casing cap, prevents the free movement of said locking bolt;

said manual disengaging apparatus, accessible from the passenger compartment of said vehicle by means of a gear shaft that is axially attached to a one tooth gear inside said casing cylinder;

said one tooth gear engages with the notches in said locking bolt;

said gear shaft is held in place by and protrudes through a retainer, and a bushing that is securely attached to the outside of said casing cylinder, and through a door panel grommet before engagement with a key;

said key, when turned, will cause said gear shaft to turn said one tooth gear into said notched locking bolt, causing disengagement of said locking bolt from said receptacle;

turning said one tooth gear in opposite direction will cause engagement of said locking bolt into said receptacle;

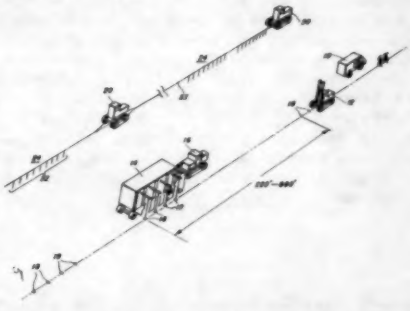
said retainer is free to rotate inside said bushing;

locking washers prevent said retainer, said gear shaft, and said bushing from moving laterally within said casing cylinder.

4,372,420
SEISMIC EXPLORATION SYSTEM

Arlton H. White, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 731,400, Oct. 12, 1976, Pat. No. 4,139,074. This application Feb. 2, 1979, Ser. No. 8,902
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.³ G01V *1/38*
U.S. Cl. 181—120 4 Claims



1. A method of marine seismic exploration in water beneath an ice layer comprising the steps of:

(a) forming an aperture extending through said ice layer,

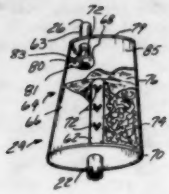
(b) lowering at least one acoustic source through said aperture into the water,

(c) activating said acoustic source at least once while immersed in said water,

(d) withdrawing said acoustic source from said aperture, and

(e) activating said acoustic source subsequent to withdrawal from the water and prior to lowering through a second aperture.

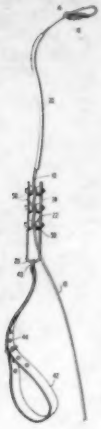
4,372,421
VEHICLE EXHAUST SYSTEM
Otis Jackson, 13284 Caldwell, Detroit, Mich. 48212
Continuation-in-part of Ser. No. 597,082, Jul. 18, 1975, abandoned. This application Jul. 19, 1979, Ser. No. 58,860
Int. Cl.³ F01N *1/24, 7/18*
U.S. Cl. 181—243 **2 Claims**



1. A muffler for a vehicle exhaust system comprising:
a housing having an inlet and outlet and first, second and third interior portions formed therein;
an inlet conduit disposed in said inlet of said housing, said inlet conduit extending a distance into said first portion of said housing, said inlet conduit having a plurality of baffles along its extent thereof defining a fluid flow path through said inlet conduit into said first portion of said housing;
a mass of sound deadening material disposed in said first portion of said housing surrounding said inlet conduit;
a layer of wire mesh surrounding said mass of sound deadening material;
a mass of wire mesh disposed adjacent to said mass of sound deadening material in said second portion of said housing and substantially filling said second portion of said housing;
a layer of sound deadening material disposed within said housing and surrounding said second and third portions;
partition means disposed between the second and third portions of the housing, said partition means having a first aperture and a plurality of second apertures disposing said third portion of said housing in fluid flow communication with said second portion of said housing;
an outlet conduit extending a distance into said third portion of said housing adjacent to said second portion therein and received in said first aperture in said partition means to define a fluid flow path between said second portion of said housing and said outlet conduit, said outlet conduit having a baffle therein defining a fluid flow path between said third portion of said housing and said outlet conduit; and wherein
one end of said housing is detachably secured thereto and further wherein the mass of sound deadening material and the mass of wire mesh are removable from the interior of said housing.

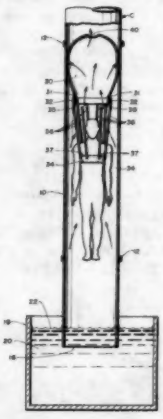
4,372,422
ESCAPE DEVICE
Thurman V. Sharp, 1813 Sanford Apt. 2, Little Rock, Ark. 72202
Filed Dec. 29, 1980, Ser. No. 220,966
Int. Cl.³ A62B *1/16, 35/00*
U.S. Cl. 182—5 **20 Claims**

1. A device suitable for use in lowering a load comprising a frame, a roller rotatably mounted on said frame, said roller having a groove positioned around said roller, the surface of said roller adjacent a side of said groove being inclined inwardly toward said groove, a flexible line forming a loop around said roller within said groove, said line extending in generally opposite directions from said roller, said groove having a width confining said line such that said line frictionally contacts itself at the entrance and exit portions of the loop in said groove, said frame and roller being movable along said line by application of a load on said frame, and the movement



of said frame and roller being controllable by application of a force on said line.

4,372,423
ESCAPE CHUTE
Ronald L. Pelley, 760 E. Telegraph Rd., Box 385, Fillmore, Calif. 93015
Filed Jan. 5, 1981, Ser. No. 222,306
Int. Cl.³ B64D *17/00;* **A62B** *1/20*
U.S. Cl. 182—42 **5 Claims**



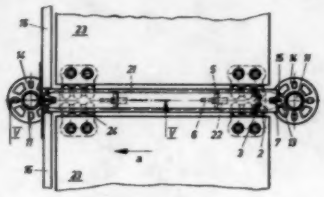
1. An apparatus for descending an object from an elevated location comprising:
an elongated tube;
a means of restricting the air flow through the lower tube exit; and
a descending device within said tube connected to said descending object, said device restricting the relative upward air flow passed said device during the descent, whereby a buildup of pressure occurs below said descending device during the descent.

4,372,424

SAFETY DEVICE FOR SCAFFOLDINGS

Ruth Langer, Ochsenbacher Strasse, 7129 Güglingen-Eibensbach, (Württemberg), Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,344
Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020389
Int. Cl.³ E04G 5/08, 7/28
U.S. Cl. 182—119 5 Claims



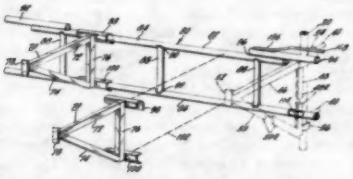
1. A device for protecting against lifting gangplanks of a scaffolding assembled of vertical supports, trough-shaped crossbars secured to the supports, and claw hooks for mounting the gangplanks to the crossbars, said device comprising oblong holes formed in bottom portions of respective crossbars and being oriented in the longitudinal direction of the crossbars; a rail arranged above each crossbar and overlapping the claw hooks; at least one mounting projection fixed to each rail and having a hook-shaped end portion insertable into corresponding oblong hole and engageable with the crossbar; and a locking plate hinged to an end of the rail.

4,372,425

AUXILIARY SCAFFOLDING ATTACHMENT

Michael Murphy, 234 Prospect Ave., Clifton Heights, Pa. 19018

Filed Jan. 12, 1981, Ser. No. 224,398
Int. Cl.³ E04G 1/15, 1/20
U.S. Cl. 182—179 12 Claims



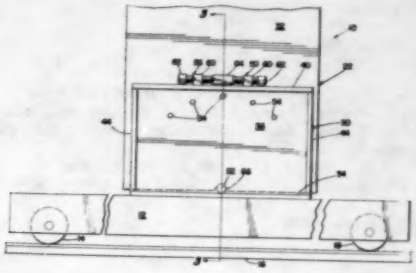
1. An auxiliary attachment for a scaffolding assembly alongside a vertical structure, said scaffolding assembly including outwardly extended brackets adapted for mounting and supporting a horizontal worker support platform, said auxiliary attachment being adjustably connected to said scaffold assembly, a portion of said auxiliary attachment extending outwardly beyond said scaffolding assembly in spaced relationship intermediate said spaced brackets, said auxiliary attachment including a detachable support and an auxiliary plank support bracket attached thereto and adapted to underlie and support an otherwise unsupported portion of a said worker support platform at a position spaced from a said extended scaffold worker support bracket.

4,372,426

MAST STRUCTURE

Reynold F. Gamundi, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 106,077, Dec. 20, 1979, abandoned.
This application Feb. 22, 1982, Ser. No. 350,703
Int. Cl.³ B66B 9/00
U.S. Cl. 187—1 R 6 Claims



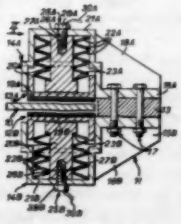
1. In a storage/retrieval machine comprising a frame and a mast assembly attached to said frame and extending vertically therefrom; the improvement wherein said mast assembly comprises an upstanding support structure attached to said frame, said support structure including first and second spaced walls upstanding from said frame, and pivot pin means received in a lower portion of said first and second walls; a mast including at least one plate member received between said first and second walls in face-to-face contact therewith and having an essentially V-shaped notch formed in the lower edge thereof engageable with said pivot pin means; clamp means acting on at least one of said first and second walls of an upper portion thereof and on said at least one plate member to apply a clamping force therebetween, said clamp means comprising at least one threaded fastener received through a clearance hole formed in said wall and threaded into said plate member with a head formed on said fastener in engagement with said wall; and adjustable means acting between at least one of said first or second walls and said at least one plate member for pivotally moving said mast about said pivot pin means against said clamping force.

4,372,427

INDUSTRIAL EMERGENCY BRAKE

Leonce Rogier, Saint-Denis, France, assignor to VALEO, Paris, France

Filed Sep. 19, 1980, Ser. No. 188,917
Claims priority, application France, Sep. 21, 1979, 79 23508
Int. Cl.³ F16D 55/08, 59/00; B60T 7/12
U.S. Cl. 188—72.1 6 Claims



1. In an industrial emergency brake comprising a fixed support, at least one braking member adapted to be applied against

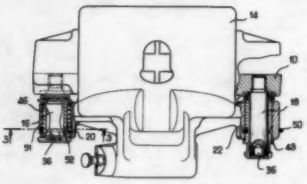
a brake member, means constantly engaging and urging said braking member towards said brake member and releasable retaining means supporting said braking member against movement by said first-mentioned means and normally maintaining it out of engagement with the brake member, the improvement wherein said releasable retaining means comprises a frangible explosive component containing an explosive charge and adapted to be fractured upon detonation whereupon said first-mentioned means moves said braking member into engagement with the brake member.

4,372,428

DISC BRAKE HAVING SLIDING CALIPER

Jean Delaunay, Drancy, and Claude Le Marchand, Domont, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Oct. 27, 1980, Ser. No. 200,679
Claims priority, application France, Nov. 8, 1979, 79 27568
Int. Cl.³ F16D *65/18*
U.S. Cl. 188—73.35 **1 Claim**



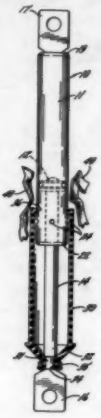
1. A disc brake with a caliper, means including a pair of axial columns for mounting said caliper on a fixed support in which two friction elements are anchored, said friction elements being capable of coming into frictional engagement with the opposite faces of a rotating disc on operation of actuating means consisting of a brake motor acting directly on one of the friction elements and acting on the other friction element by reaction through the sliding caliper, said columns passing through bores provided in the fixed support and through openings in the caliper, said openings provided in the caliper being provided with notches and the walls of said caliper openings having substantially the form of a C in cross section in such a manner that said columns can be introduced into the openings by being presented transversely in relation to their longitudinal axes, said pair of columns defining a front column and a rear column, the notch in the opening in which the rear column is engaged being directed in the direction of the plane containing the longitudinal axes of the two columns and extending away from the front column, a sleeve assembly being mounted relative to said rear column to cooperate with the corresponding opening formed in the caliper, characterized in that said sleeve assembly is provided at its periphery with a radial projection made of a resilient material and extending radially outwardly from said periphery to cooperate with a central portion of the wall formed by the caliper opening which receives said rear column, said radial projection being compressed between said periphery and said caliper opening wall in a predetermined position in order to take up the play and the manufacturing tolerances and to avoid pivoting of the caliper relative to said pair of columns as well as the noises due to the vibrations of the whole of the brake during its use, said sleeve assembly being provided with at least one bead spaced circumferentially from said projection, said projection and said bead being integral with the sleeve assembly and extending axially of the peripheral of the sleeve assembly, said bead enabling any relative rotation of said sleeve assembly in relation to said bore to be avoided so as to maintain said projection in the predetermined position in relation to said caliper opening.

4,372,429

PNEUMATIC SPRING WITH PROTECTIVE BOOT

Thomas O. Marx, Rockton, Ill., assignor to Atwood Vacuum Machine Co., Rockford, Ill.

Filed Apr. 7, 1980, Ser. No. 137,747
Int. Cl.³ F16F *9/38*
U.S. Cl. 188—322.12 **6 Claims**



1. A gas spring assembly for initial use in adverse environmental conditions and subsequent use in less adverse environmental conditions comprising a fluid containing cylinder having a closure at one end thereof, a plunger rod slidably supported in the other end of said cylinder and having a piston at the end thereof within said cylinder, said piston and plunger rod being movable relative to said cylinder from a retracted position in which said rod is received within said cylinder a maximum amount to an extended position in which said plunger rod extends outwardly of said cylinder a maximum amount, an elongated boot made of elastomeric material secured to and surrounding the portion of said plunger rod extending outwardly from said cylinder and being movable in unison with said plunger rod for protectively containing the extended plunger portion in both extended and retracted positions, said boot having one end in sliding engagement with the outer surface of said cylinder, a temporary relatively thin walled protective sheath tightly surrounding said boot and a portion of said cylinder, said sheath being movable with said boot and rod relative to said cylinder while firmly holding said one boot end in relatively tight sliding contact with said cylinder thereby effectively preventing contaminants from passing between said sliding boot end and said cylinder during initial use of said assembly, and said temporary sheath being made of a frangible material which is destructible and readily removable from said boot upon exposure to a predetermined temperature which is unharmful to the material of said boot thereby leaving said boot as a permanent protector of the extendible plunger rod during subsequent use of said assembly.

4,372,430

DRUM BRAKE AND RETAINING SPRING

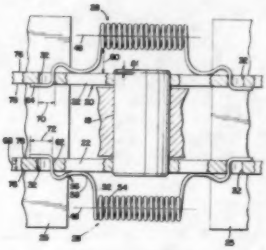
Dennis A. Borugian, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 124,487, Feb. 25, 1980, abandoned. This application Nov. 4, 1981, Ser. No. 318,227
Int. Cl.³ F16D *51/22*
U.S. Cl. 188—329 **4 Claims**

1. An improved drum brake of the type comprising a rotatably mounted drum, a fixed support, a single anchor pin fixed to the support, a pair of arcuate brake shoes each including at least one web and a friction lining, both of said brake shoes

pivotably supported at one end of the webs thereof on said anchor pin, said webs defined by first and second substantially parallel surfaces extending generally perpendicular to the axis of said anchor pin, said first surfaces defining the top of said webs and said second surfaces defining the bottoms of said webs, said anchor pin extending upwardly beyond the first surfaces of said webs by a first axial distance, a brake shoe coil tension retaining spring having one end thereof attached to one of said shoes and the other end thereof attached to the other of said shoes for retaining said shoes pivotably on said anchor pin and an actuating member for selectively radially outwardly pivoting said shoes about said anchor pin, the improvement comprising:

said retention spring being of a one-piece construction comprising an axially extending centrally located coil portion and an attachment portion extending axially outwardly from each of the opposite ends of said coil portion, each attachment portion defined by a first section extending



generally downwardly from the bottom of the coil portion, a second section extending upwardly and axially outwardly from the bottom of the first section and terminating at a point below the bottom of the coil portion, a third section extending downwardly from said second section to a point below the bottom of the junction of said first and second sections and a fourth section extending generally axially outwardly from the bottom end of said third section, each of said webs provided with an aperture, each of said fourth sections having an axial length exceeding the diameter of said apertures, a line connecting the axis of said apertures passing through said anchor pin when said shoes pivotably retained on said anchor pin, said spring being inserted into said apertures from the first surfaces of said webs such that said fourth sections engage said second surfaces, the junctions of said first and second sections engaging said first surface and said coil portion elevated above said first surfaces by a distance greater than said first axial distance.

4,372,431

SIX AXIS VIBRATION ISOLATION SYSTEM

Rene A. Desjardins, Media, Pa., assignor to The Boeing Company, Philadelphia, Pa.

Filed Nov. 5, 1979, Ser. No. 91,437

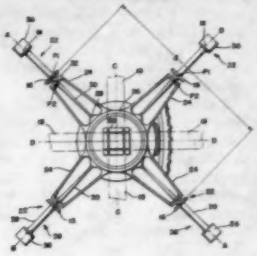
Int. Cl.³ F16F *7/10*

U.S. Cl. 188—380 **37 Claims**

34. A vibration isolation system for isolating a body from linear vibratory forces acting along three mutually orthogonal axes, and rotational vibratory forces acting about said three mutually orthogonal axes, said vibratory forces being generated by a vibrating mass coupled to said body, wherein the vibration isolation system comprises:

two elongated collinear vibration isolators disposed such that:

(i) they extend in opposite directions relative to the center of the three mutually orthogonal axes; and



(ii) the collinear axis intersects the center of the three mutually orthogonal axes.

4,372,432

BI-DIRECTIONAL CLUTCH

Martin Waine, Riverside, and Jules Nisenson, Stamford, both of Conn., assignors to General Clutch Corp., New York, N.Y.

Filed Mar. 18, 1981, Ser. No. 244,975

Int. Cl.³ F16D *67/00;* **B60T** *7/12*

U.S. Cl. 192—8 C **13 Claims**

1. A bi-directional clutch comprising a core member having a cylindrical surface; an unwrap spring having helical turns, said helical turns being located about the cylindrical surface of the core member and normally gripping the cylindrical surface of the core member to prevent rotation of the spring relative to the core member; said unwrap spring further including a first spring tang and a second spring tang, said spring tangs extending outwardly past the circumference of the helical turns and being responsive to a force applied to the first spring tang in a first direction to cause the helical turns to tighten about the core member and to a force applied to the frst spring tang in a second direction to cause the helical turns to loosen about the core member enabling the spring to rotate relative to the core member, and being further responsive to a force applied to the second spring tang in said first direction to cause the helical turns to loosen about the core member enabling the spring to rotate relative to the core member and to a force applied to the second spring tang in said second direction to cause the helical turns to tighten about the core member; a driving member disposed for rotation about the core member, said driving member having two tang-receiving surfaces, one of said tang-receiving surfaces being located such that rotation of the driving member relative to the core member in said second direction causes said one tang-receiving surface to apply a force to said first spring tang in said second direction to loosen said helical turns, the other of said tang-receiving surfaces being located such that rotation of the driving member relative to the

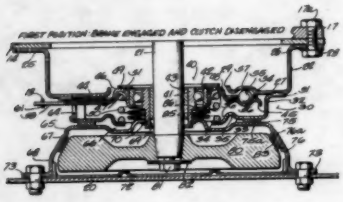
core member in said first direction causes said other tang-receiving surface to apply a force to said second spring tang in said first direction to loosen the helical turns; and a driven member disposed for rotation with said spring, said driven member having two tang-abutting surfaces, one of said tang-abutting surfaces being located such that direct rotation of the driven member in said first direction causes the tang-abutting surface to apply a force to the first tang in said first direction to tighten the helical turns and prevent further rotation of the driven member and spring relative to the core member, the other of said tang-abutting surfaces being located such that direct rotation of the driven member in said second direction causes the tang-abutting surface to apply a force to the second tang in said second direction to tighten the helical turns and prevent further rotation of the driven member and spring relative to the core member, said tang-abutting surfaces being further operative to transfer driving member-controlled rotation of the spring relative to the core member to the driven member.

4,372,433

COMBINATION CLUTCH/BRAKE MECHANISM

Robert K. Mitchell, and Robert K. Catterson, both of Brookfield, Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Apr. 14, 1980, Ser. No. 139,880
Int. Cl.³ F16D *67/02*; A01D *69/08*
U.S. Cl. 192—18 R **2 Claims**



1. A combination clutch/brake mechanism for selectively effecting a torque transmitting connection between coaxial driving and driven means for preventing rotation of the driving element without interfering with continued rotation of the driving element comprising:

a drive shaft

a driving disc connected to the shaft and having a clutch surface,

a bearing assembly mounted for axial movement on said shaft and having a first rotatable portion and a second portion,

a carrier connected to the rotatable portion of said bearing assembly and carrying an element to be driven, said carrier having spaced apart first and second surfaces, said first surface being cooperable with said clutch surface of said disc to effect transmission of torque from the disc to the driven element,

a stationary brake member having a brake surface cooperable with the second surface of the carrier to hold said carrier against rotation,

resilient means interconnecting said bearing assembly and said stationary brake member for urging said bearing assembly axially of said shaft in one direction to thereby effect engagement of said second surface of the carrier with said brake surface,

operating means operably connected to the second portion of said bearing assembly for moving said bearing assembly axially of said shaft in the opposite direction to thereby effect engagement of the first surface of said carrier with said clutch surface and transmit torque from said disc to said carrier, and

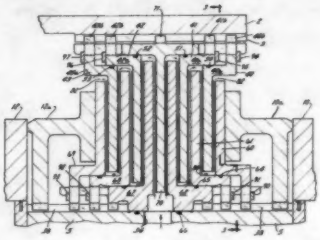
second resilient means interconnecting said bearing assembly and said carrier, said second resilient means being arranged so that continued movement of said bearing assembly in said opposite direction after engagement of the first surface of said carrier with said clutch surface will compress said second resilient means to permit overtravel of said operating means beyond that needed to obtain clutch engagement.

4,372,434

INTERLEAVED FRICTION PLATE CLUTCH HAVING MEANS TO PREVENT PLATE WOBBLE

George R. Aschauer, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 28, 1981, Ser. No. 229,097
Int. Cl.³ F16D *25/063*, *17/72*
U.S. Cl. 192—85 AA **24 Claims**



1. A multiple, interleaved friction plate clutch comprising, a driving member, a driven member and a clutch pack between said driving and driven members, said pack comprising a plurality of externally toothed clutch plates having an axially slideable connection relative to one of said members for driving engagement therewith, said pack also including a plurality of internally toothed clutch plates which are interleaved with said externally toothed clutch plates and which have an axially slideable connection relative to the other of said members, means for clamping said interleaved plates together to provide a releasable driving connection between said members, whereby said plates may be shifted between a clutch clamp-up position and a clutch released position in which said plates are separated from one another and have relative rotation therebetween, fluid sealing means between said externally toothed plates, second fluid sealing means between said internally toothed plates, and fluid pressure means acting between said plates to positively hold said plates under fluid pressure and normal to the axis of rotation of said clutch when said clutch is in said released position and said plates are separated from one another and have relative rotation therebetween, to thereby prevent wobble of said clutch plates.

4,372,435

POSITIVELY DRIVEN STEERING MEMBER FOR CONVEYING APPARATUS

Bernard G. Bradbury, Chico, Calif., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Oct. 27, 1980, Ser. No. 201,666
Int. Cl.³ B65G *47/48*, *47/68*
U.S. Cl. 198—356 **17 Claims**

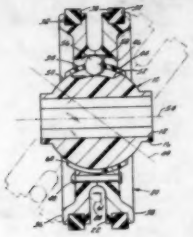
1. A device for supporting and conveying articles on a conveyor and adapted for use as a diverter mechanism for selectively determining the path of the articles, comprising:

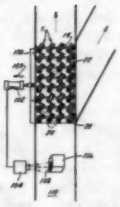
a wheel having a spherically curved inner surface defining a central opening and having an outer rim;

a hub having an axial bore adapted to be mounted on a singular shaft for rotation therewith, said singular shaft extending beyond the sides of said hub, and having a

spherically curved outer surface adapted to fit inside of said inner surface;

said rim having a circumferential channel adapted to receive a control peg, whereby the relative motion between said wheel and said hub may be controlled;





a coupling means for securing said wheel to said hub and permitting the axis of said wheel to be rotated relative to the axis of said hub in any direction while restraining relative motion between said wheel and said hub about the axis of said hub.

4,372,436

APPARATUS FOR DEFLECTING FLAT WORKPIECES THROUGH 180° WITH SIMULTANEOUS ROTATION THROUGH 90°

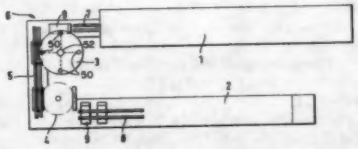
Fritz Achelpohl, and Richard Feldkamper, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 196,122

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941151

Int. Cl.³ B65G *29/00*

U.S. Cl. 198—377 **2 Claims**



1. Apparatus for deflecting continuously conveyed flat workpieces, preferably tube sections having side folds, through 180° while turning the workpieces through 90°, characterised by the following combination of features:

(a) two double belt conveyors (7, 8) comprising spaced conveyor belts travelling in parallel in opposite directions are spaced apart and parallel,

(b) transversely to the double belt conveyors (7, 8) in front of the delivery and supply ends thereof, respectively, a double belt conveyor (5) bridges the spacing therebetween and has endless conveyor belts divided in the same manner,

(c) on the inside of the angle formed by the transversely extending double belt conveyor (5) and one of the two parallel belt conveyors there are turning means (3) with at least two pairs of grippers which co-operate in the manner of tongs, are disposed on a radial line, engage between every two conveyor belts of the double belt conveyors (7, 5) and are provided with a control that opens the gripper halves when the conveyor belts are being passed and closes them between same, and that takes over the workpieces (9) from the supplying conveyor (7) substantially tangentially and, after rotation through 90°, delivers same substantially tangentially after their introduction into the belt nip of the following perpendicular double belt conveyor (5),

(d) on the inside of the angle formed by the transversely extending double belt conveyor (5) and the other of the two parallel belt conveyors (8) there is a transfer device (4) consisting of at least one pair of parallel arms (10) which extend radially to their common rotary axis (11) and are provided with parallel guide gearing for a respective carrier (23, 24) near the ends of the arms that is secured to a shaft (21, 22) parallel to the rotary axis (11), wherein at least two gripper halves (25, 26) pivoted to each carrier (23, 24) co-operate in the manner of tongs with gripper halves on the opposite carrier and wherein the grippers formed by the gripper halves (13, 14) take over the workpieces (9) from the supplying double belt conveyor (5) substantially tangentially and deliver same substantially tangentially parallel to themselves into the belt nip of the following perpendicular double belt conveyor (8) and are provided with controls which open the gripper halves (13, 14) when the conveyor belts are being passed and close them again between same.

4,372,437

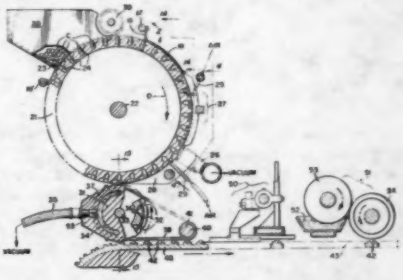
GAUGING ASSEMBLY FOR CAPSULE ORIENTING AND TURNING APPARATUS

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Apr. 7, 1980, Ser. No. 137,850

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—380 **7 Claims**



6. In an orienting and turning apparatus for capsules having body portions and enlarged cap portions arranged along substantially a common axis, including a continuously movable capsule transporting cylinder having a plurality of spaced-apart pockets for the capsules, and gauging means adjacent the path of movement of said pockets defining along with a lateral edge of said pockets an elongated passageway proximate the curved surface of said transporting cylinder and extending in the circumferential direction therealong, the width of said passageway being adjustable to maintain said caps-up capsules caps-up by contact therewith as said capsules are transported along said passageway by travel in said pockets formed in said

cylinder as said cylinder rotates whereby all of said cap portions of said caps-up capsules are brought to an attitude in a substantially common direction, one lateral boundary of said passageway being defined by an adjustably movable gauging member of said gauging means including a ceiling extending above said pockets and positioned along the transport direction of said conveyor, and a wall member of said gauging means depending from said ceiling member radially inwardly towards said transport cylinder curved surface along said transport direction in contiguous relation to said ceiling member to form a side of said passageway, said gauging means wall member forming said passageway side extending along a row of pockets, shielding against flow of stray currents of air from neighboring rows, said gauging means wall member being moveable axially with respect to said transport cylinder to adjust said width of said passageway wherein the center line of said passageway moves in the axial direction with respect to said transport cylinder as said wall member moves to adjust width of said passageway.

4,372,438

APPARATUS FOR ADJUSTING INTERVALS OF OBJECTS BEING CONVEYED

Torahiko Hayashi, 2-3, Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

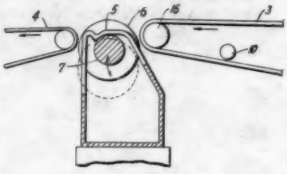
Continuation of Ser. No. 38,215, May 11, 1979, abandoned, which is a continuation of Ser. No. 782,040, Mar. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 591,041, Jun. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 287,899, Sep. 11, 1972, abandoned. This application Nov. 13, 1980, Ser. No. 206,633

Claims priority, application Japan, Sep. 10, 1971, 46-70161

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.³ B65G *47/32*

U.S. Cl. 198—459 **4 Claims**



1. An apparatus for adjusting intervals between objects being transported on a series of conveyors, comprising

means including a holding member fixed in position between two of said conveyors for fully supporting each said object individually and retarding movement of said objects from one to the other of said two conveyors, said holding member having a purality of slotted passageways extending between said two conveyors;

a shaft secured for rotation beneath said passageways and having a plurality of radial flanges each aligned with a respective one of said passageways; and

control means operatively associated with said shaft for repetitively raising and lower said shaft in a predetermined sequence for protruding said flanges through said passageways to raise objects held thereon and carry them from one to the other of said two conveyors during rotation of said shaft and thereafter withdrawing them from said passageways, whereby the intervals between the objects may be adjusted without harm to the objects even if they should have soft bottoms.

4,372,439

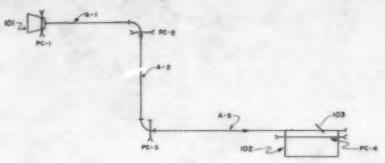
ELECTRONIC CONVEYOR CONTROL APPARATUS

Guy C. Dempsey, 2197 Mayflower Dr., Woodbridge, Va. 22192

Filed Nov. 25, 1980, Ser. No. 210,463

Int. Cl.³ B65G *43/08*

U.S. Cl. 198—470 **5 Claims**



1. A conveying system comprising a plurality of conveyors adapted to move an object from one point to another; electric power means for driving each conveyor, said power means comprising a motor and a starter for controlling said motor, said starter having a starting contact and a stopping contact; photosensing means positioned near the leading ends of each conveyor for sensing the approach of an object to be conveyed; electric control means for said conveying system, said control means comprising separate electrical circuits for each conveyor and timing means in operative electrical association with each of said circuits, said separate circuits being operably interrelated so that the overall functions of the conveying systems are correlated and represent said single control means; each of said photosensors being adapted through said electric circuits to operate the starting contacts of the power means for each of said circuits in response to a change in condition initiated by the approach of the object to be conveyed, said timing means being adapted through said electric circuits to time each object being conveyed to traverse the length of the conveyor and to shut down, through said stopping contact of said power means, the conveyor when the object has traversed its length; said timing means further including, in operative relationship with said electrical circuits, a memory providing for time accumulation such that, should a conveyor be caused to stop in response to an electrical function in said circuits, each timer would hold its accumulated time and upon contact of said conveyor, would resume its time function and cause said conveyor to run for the unexpired portion of said preset time cycle; each of said circuits further including a time delay relay, each relay being operably associated with a photosensor positioned at the leading edge of an adjacent downstream conveyor and adapted to stop the conveyor associated with the given circuit and through said stopping contact of said power means, in response to the blocking of said photosensor for a period in excess of the preset time limit.

4,372,440

END SHAFT MOUNT FOR CONVEYOR

Gerald A. Ringis, Des Moines, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1980, Ser. No. 218,707

Int. Cl.³ B65G *23/44*

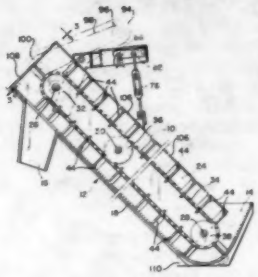
U.S. Cl. 198—728 **25 Claims**

1. In a mechanical conveyor of a type having a main frame; a transverse shaft at one end of said main frame, carrying a pair of axially spaced apart chain supporting wheels; and material moving means including a pair of laterally spaced apart endless chains, one on each side of the conveyor, extending about the chain supporting wheel on its side of the conveyor, an improved mount for said shaft, comprising:

a shaft mounting frame in the nature of a first class lever, fulcrum means mounting said shaft mounting frame onto said main frame, for pivotal movement about a transverse pivot axis which is parallel to said shaft, said shaft mounting frame including a first lever portion projecting from said pivot axis toward the shaft and carrying journal

mounts for the opposite ends of the shaft, and a second lever portion projecting in the opposite direction from said pivot axis; and adjustable arm means extending between the second lever portion of the shaft mounting frame and a portion of the main frame spaced axially inwardly of said main frame from said pivot axis;

said main frame including sidewalls having aligned shaft end receiving openings therein, said shaft extending laterally



across the main frame and includes end portions which project outwardly through said openings, and the first lever portion of the shaft mounting frame comprising an arm member on each side of the conveyor, each said arm member being located outwardly adjacent the main frame sidewall on its side of the conveyor, and the journal mounts for the opposite ends of the shaft being carried by said arm members.

4,372,441

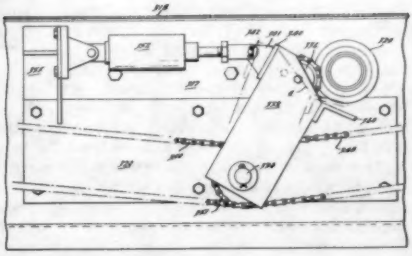
ACCUMULATING CONVEYOR

Robert Krammer, deceased, late of White Bear Lake, Minn. (by Ruth Krammer, legal representative), assignor to Rexnord Inc., Milwaukee, Wis.

Division of Ser. No. 942,660, Sep. 15, 1978, Pat. No. 4,301,914, which is a continuation-in-part of Ser. No. 831,756, Sep. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 688,255, May 20, 1976, abandoned. This application Mar. 16, 1981, Ser. No. 244,014

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—781 **4 Claims**



1. A drive module for a conveyor having a plurality of load carrying rollers arranged in generally parallel, side-by-side relationship and mounted for rotation on transversely extending shafts supported by parallel side rails, said drive module comprising:

(a) power means for driving said module comprising at least two endless powered force transmitting members disposed below said load carrying rollers;

(b) a generally vertically extending supporting device mounted to one of said side rails;

(c) rotatable means supported by said supporting device for supporting two of said powered endless force transmitting members;

(d) a rotatable friction wheel operatively connected to said load carrying rollers so that when said friction wheel is rotated it will cause said load carrying rollers to rotate;

(e) a rotatable pressure roller movable between a first position out of engagement with said friction wheel and a second position in which said roller drivingly engages said friction wheel;

(f) power means for drivingly engaging said pressure roller and engageable with said force transmitting power means, including a first continuously driven rotating sprocket disposed on the pivotal axis of said support means, a second rotating sprocket disposed on the rotational axis of and concentrically connected to said pressure roller, and an additional endless chain drivingly interconnecting said two sprockets;

(g) support means on said supporting device for supporting said pressure roller for movement between said first and second positions, said second position being said driving position; and

(h) actuating means for moving said support means from said first position to said second position.

4,372,442

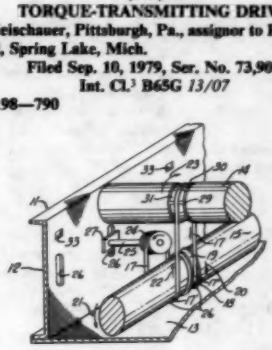
TORQUE-TRANSMITTING DRIVE

Fred J. Fleischauer, Pittsburgh, Pa., assignor to Ermanco Incorporated, Spring Lake, Mich.

Filed Sep. 10, 1979, Ser. No. 73,901

Int. Cl.³ B65G *13/07*

U.S. Cl. 198—790 **5 Claims**



1. A torque-transmitting drive comprising a frame, a rotatable driving member, a rotatable driven member spaced therefrom, an endless transmission belt engaging said members to transmit torque by frictional engagement from said driving member to said driven member with said belt folded over said members such that two strands of said belt pass over said members and neither member passes through said endless belt, a bearing sleeve slippingly mounted on each of said members with one strand of said belt at each fold passing over said bearing sleeve, and two free-wheeling idler pulleys mounted to said frame with opposite end loops of said belt respectively looped over said pulleys with said belt folds intermediate said opposite end loops.

4,372,443

CIGARETTE PACKAGE WHICH HAS DEVICE TO OPEN AND CLOSE

Choi Woo Seop, 567 Hapjeong-Ri, Pyongtaek-Eup, Pyongtaek-Kun, Kyonggi-Province, Rep. of Korea

Filed Feb. 9, 1981, Ser. No. 232,697

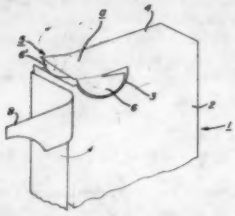
Claims priority, application Rep. of Korea, Jan. 24, 1981, 496/81[U]

Int. Cl.³ B65D *85/10, 85/12*

U.S. Cl. 206—264 **1 Claim**

1. A package formed from a folded blank for containing

cigarettes, the package having side surfaces, front and rear surfaces interconnecting the side surfaces, a top surface, and a bottom surface; the top surface of the package having a crease line formed therein spaced from and extending parallel to the plane of the front surface and first and second slots extending from ends of the crease line towards the rear surface; a portion of the blank forming one of the side surfaces having a first crescent-shaped part formed therein by a groove extending between an end of said first slot spaced intermediate said crease line and rear surface and the intersection of said front, said top, and said one side surface; another portion of the blank forming



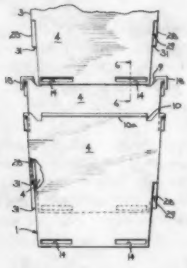
a second crescent-shaped part protruding from the portion of the blank forming the top surface, said second part being separated from the top surface by said second slot and being connected to the portion of the top surface located between said crease and said front surface; portions of said blank when folded being folded over said first and said second crescent-shaped parts to maintain the package closed, said top surface being foldable about the crease line to thereby open the package, wherein one of said-crescent shaped parts has a projecting portion for limiting movement of the top surface about the crease line when the package is opened.

4,372,444

STACKABLE/NESTABLE/DIVIDABLE STORAGE BIN

Alexander J. Le Grand, Hartland, and Richard A. Barnhouse, Watertown, both of Wis., assignors to Menasha Corporation, Neenah, Wis.

Filed May 21, 1981, Ser. No. 265,790
Int. Cl.³ B65D *21/04, 25/06*
U.S. Cl. 206—505 **4 Claims**



1. In a storage bin having a horizontal bottom wall, vertical side walls, and a vertical rear wall that has horizontal upper and lower edges, the side walls being outwardly inclined from bottom to top with the lower edge of the rear wall being correspondingly shorter than its upper edge,

the improvement wherein:

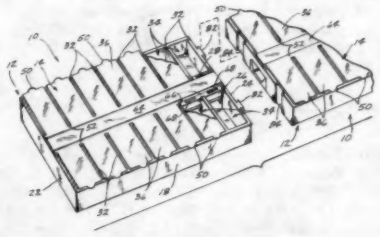
a central part of the upper edge of the rear wall that corresponds to the length of the lower edge of the rear wall constitutes a stacking tongue including a rearwardly extending lip; the upper rear wall edge has downwardly extending stacking notches at the ends of the stacking tongue; the lower rear edge of the bin defines a transverse stacking channel extending across the length of the lower rear wall edge, said stacking channel comprising front, top and rear surfaces and a bottom surface in the form of a hook flange that leads toward but stops short of the front surface to define a stacking slot that is narrower than the front to rear dimension of the lip, the stacking slot being capable when the front of the bin is tipped upwardly of admitting the stacking tongue of a like bin below into the stacking channel, return of the upper bin to horizontal then putting the elements in a position where the stacking tongue of the lower bin supports the top surface of the stacking channel of the upper bin and is engageable with the other surfaces thereof to limit relative vertical and longitudinal movement of the bins; and the side walls have lower rear corner portions that close off the ends of the stacking channel and are disposed in respective stacking notches when the bin is stacked with a like bin below.

4,372,445

MEDICATION DISPENSER

Paul J. Keffeler, 9706 Brentwood, Omaha, Nebr. 68114

Filed Feb. 19, 1981, Ser. No. 235,933
Int. Cl.³ B65D *83/04*
U.S. Cl. 206—532 **16 Claims**



1. A medication dispenser, comprising,

a container comprising a bottom, opposite upstanding side walls, opposite upstanding end walls, a divider wall extended between said end walls in spaced relation from one side wall and a plurality of partitions connected to and extended between said divider wall and one side wall to define a plurality of open topped medication compartments,

a plurality of compartment covers, each adapted to overlie and close a respective one of said compartments,

each cover including a separate integral fracturable tab depending therefrom adjacent one end thereof, and

coacting lock means on said container and on the individual tabs for independently securing each tab in snap fit locked relation onto said container when said covers are positioned to close said compartments whereby each cover is fractured from its respective tab in response to upward movement of the opposite end of said cover to open said compartment.

4,372,446

SELF-LOCKING PROTECTIVE PADS AND BLANK THEREFOR

Matthew S. Konopko, Oak Lawn, Ill., assignor to Stone Container Corp., Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,193
Int. Cl.³ B65D *81/02*
U.S. Cl. 206—586 **9 Claims**

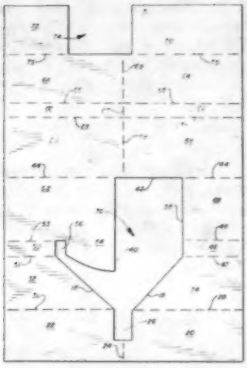
1. A pad for protection of a crated object, formed from a single blank of foldable sheet material, said pad comprising:

A. a pair of multiple-ply wall formations intersecting at an angle to form two walls of a corner configuration.

B. a multiple-ply base formation connected to both of said walls at substantially right angle in said corner configuration;

C. said base formation being of generally L-shaped configuration having conjoined first multiple-ply leg and second multiple-ply leg formations; and

D. said first and second multiple-ply leg formations having



an equal number of overlying plies, the plies of the first leg formation being in generally coplanar alignment with the corresponding plies of the second leg formation, one of the plies of the first leg formation including a projecting coplanar wedge slidably received between a pair of immediately adjacent plies of the second leg formation, one of which corresponds to the ply of the first leg formation from which the wedge projects, said pair of immediately adjacent plies releasably frictionally retaining said wedge against slidable withdrawal from therebetween.

4,372,447

FLUSHABLE TOWELETTE

Gerald D. Miller, Belle Mead, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 870,552, Jan. 18, 1978, Pat. No. 4,258,849. This application May 12, 1980, Ser. No. 148,617

Int. Cl.³ B65D *81/24*

U.S. Cl. 206—812 **3 Claims**

1. A packaged towelette composed of a sheet of nonwoven fibers impregnated with a polyvinyl alcohol binder maintained temporarily insolubilized in a gel-like form while in wet condition within said package by contact with a non-alkaline aqueous solution of a soluble salt selected from the group consisting of sodium sulfate and potassium citrate, wherein said temporarily insolubilized polyvinyl alcohol binder is dissolvable by flushing in water.

4,372,448

MULTI-PURPOSE KITCHEN DEVICE

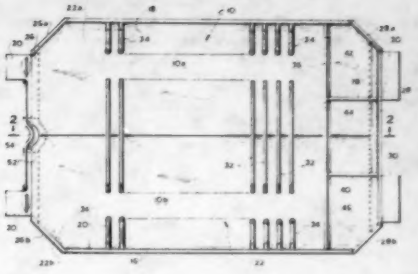
Edward Drach, 275 McLean Ave., Yonkers, N.Y. 10705

Filed Dec. 1, 1980, Ser. No. 211,814

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—41 **19 Claims**

1. A multi-purpose kitchen device comprising first and second opposing surfaces, each having first and second sections, said sections of said first surface being inclined with respect to each other at an angle greater than 180 degrees, said sections of said second surface being inclined with respect to each other at an angle less than 180 degrees, to form a drainage channel in said second surface, first and second side members, extending from and cooperating with the edges of said respective sections of said first surface, to form drainage channels along the sides of said first surface, a first end member mounted on one end of said device, said first end member having first and second



drainage ports aligned with said drainage channels on said first surface, means for supporting each of said surfaces at an incline relative to the horizontal and means, extending from said first surface, for retaining articles thereon.

4,372,449

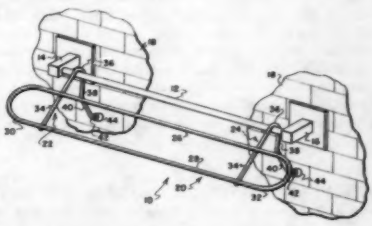
AUXILIARY TOWEL RACK

Raymond W. Fink, Maple Heights, Ohio, assignor to Tool Dynamics, Inc., Bedford Heights, Ohio

Filed Dec. 26, 1979, Ser. No. 106,757

Int. Cl.³ A47F *5/01*

U.S. Cl. 211—86 **4 Claims**



1. An auxiliary towel rack for use with a stationary, horizontally disposed towel bar positioned a fixed distance from a wall, comprising:

(a) a member having at least two elongate sections positioned substantially parallel to the towel bar, the elongate sections lying in a plane positioned at approximately a 45° angle downwardly from the horizontal, the elongate sections located at horizontal elevation at or below that of the towel bar; and

(b) at least two spaced legs connected to the elongate sections and extending between the towel bar and the wall, each leg including:

(i) a first straight section connected to the rack;

(ii) a reversely bent portion extending from one end of the first straight section, the reversely bent portion including a second straight section and a rounded interconnecting portion connecting the first and second straight sections, the first and second straight sections being spaced at approximately a 35° angle;

(iii) a third straight section extending from the second straight section, the third straight section being positioned at approximately at a right angle with respect to the first straight section; and,

(iv) a short, wall-engaging portion, the wall-engaging portion being connected to the third straight section and

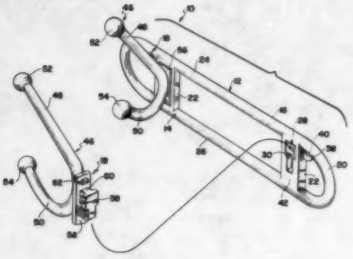
extending from the third straight section at such an angle that, in use, the wall-engaging portion is positioned approximately perpendicular to the wall.

4,372,450

HANGING RACKS

Vito Licari, and Yaffa Licari, both of Elberon, N.J., assignors to Basic Line, Inc., Cliffwood Beach, N.J.

Filed Dec. 7, 1981, Ser. No. 327,806
Int. Cl.³ A47F 5/08
U.S. Cl. 211—87 64 Claims



1. A plastic hanging rack, comprising:

plastic hanging means for hanging articles therefrom, said hanging means including a plug, and

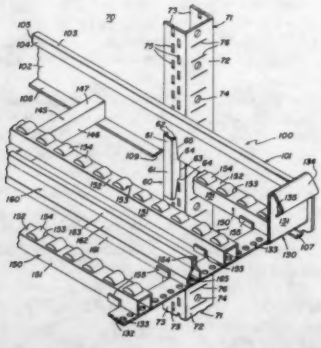
a plastic support member, having a front, a back and a receptacle provided internally of said support member, said receptacle having a receiving station sized and shaped so as to form a snap fit with said plug of said hanging means and to releaseably receive said plug of said hanging means when said plug is snapped into said receptacle from said front of said support member towards said back of said support member and a locking station communicating with said receiving station, said locking station being sized and shpaed so as to releaseably lock said plug of said hanging means in said receptacle when said plug is moved from said receiving station to said locking station.

4,372,451

GRAVITY-FEED STORAGE AND DELIVERY SYSTEM

George E. Rasmussen, Richton Park, Ill., and Lucius B. Donkle, Jr., Michigan City, Ind., assignors to Interlake, Inc., Oak Brook, Ill.

Filed Jun. 26, 1980, Ser. No. 163,342
Int. Cl.³ A47F 5/00
U.S. Cl. 211—187 16 Claims



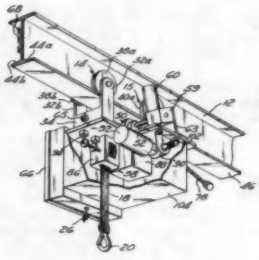
1. A storage shelf for use in a gravity-feed merchandise storage and delivery rack comprising two spaced-apart side frame members interconnected by front and rear frame members, merchandise support tracks mounted between said front and rear frame members and defining parallel rows of merchandise, a cross frame member interconnecting said side frame members between said front and back frame members and below said support tracks, an intermediate guide member mounted between said front and rear frame members and upon said cross frame member and separating adjacent rows of merchandise from each other, and attachment structure adjustable longitudinally of said intermediate guide member and readily removably interconnecting said intermediate guide member and said cross frame member to prevent lateral displacement between said intermediate guide member and said cross frame member as a result of contact with merchandise while permitting quick adjustment of the position therebetween with access only to the ends of said intermediate guide member.

4,372,452

TRANSFER HOIST FOR DISABLED PERSONS

Lawless D. McCord, Garden Grove, Calif., assignor to Independent Transfer Equipment Co., Garden Grove, Calif.

Filed Dec. 24, 1980, Ser. No. 220,123
Int. Cl.³ B66C 17/06
U.S. Cl. 212—159 5 Claims



1. A hoist suspended from an overhead rail, for use in living quarters or patient care facilities to bodily lift disabled persons and transport them along said rail from one location to another location within said quarters or facility, said hoist comprising:

trolley means for engaging said overhead rail to permit said hoist to travel along said rail;

a main frame, comprising a unitary, flat, mounting plate;

mounting means for supporting said main frame beneath said trolley means, said mounting means permitting said main frame to move vertically relative to said trolley means;

a winch, mounted on said main frame, for bodily lifting and lowering a disabled person;

power transmitting means, mounted on said main frame, for driving said winch;

a drive wheel, mounted on said main frame, and engaging said overhead rail;

a motor, mounted on said main frame, connected to drive said drive wheel to move said hoist along said rail;

cam means for selectively lowering said main frame relative to said trolley means to disengage said drive wheel and said rail, thereby permitting said hoist to be manually moved along said rail; and said cam means comprising:

a support member, connected to said trolley means;

a cam member, rotatably mounted about a rotational axis on said support member and having first and second surfaces alternately bearing against said main frame, said first surface being closer to said rotational axis than said second surface to support said main frame in a first position relative to said rail when said first surface bears against said main frame and in a second position relative to said rail

when said second surface bears against said main frame; and

means for rotating said cam member to alternately place said first and second surfaces in a bearing relationship with said main frame.

4,372,453

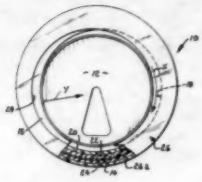
CONTAINER HOLDER

Tony E. Branscum, Winfield, Kans., assignor to Gott Corporation, Winfield, Kans.

Continuation of Ser. No. 148,391, May 9, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,564

Int. Cl.³ B65D *23/08, 81/38;* **A47J** *41/00*

U.S. Cl. 215—13 R **8 Claims**



1. A device for holding a cylindrical container, said device comprising:

a generally cylindrical upright support, said support having a generally circular outside surface and a hollow interior for receiving said container,

said hollow interior having an internal diameter of a size to accommodate said container, said interior being further characterized by occupying substantially all of the area of said cylindrical support;

means for presenting an opening in the top of said support corresponding in diameter to the diameter of said container, said opening being further characterized by being eccentric relative to said outside surface;

ring means mounted for pivotal movement over said outside surface and presenting a lip extending perpendicular to the plane of said surface,

said lip presenting an opening corresponding to the opening in the top of said support, said lip opening being eccentric relative to said outside surface and being movable from a first position wherein said openings are aligned to a second nonaligned position wherein said lip engages said container to exert a force against said container along a line corresponding to the contour of said container thereby locking said container between said lip and said means presenting the first-mentioned opening.

4,372,454

BLOW MOLDED CONTAINER WITH HANDLE

Mortimer S. Thompson, P.O. Box 113, Enfield, Conn. 06082

Division of Ser. No. 28,886, Apr. 10, 1979, Pat. No. 4,280,859, which is a continuation of Ser. No. 877,603, Feb. 14, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,081

Int. Cl.³ B65D *23/10*

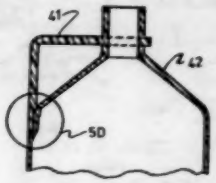
U.S. Cl. 215—100 A **10 Claims**

1. A plastic container formed from a preform having a neck portion and an expanded blown portion wherein the neck portion remains constant in size during blowing and wherein the expanded blown portion has a sidewall extending from the neck portion, comprising:

attachment means integral with and on the sidewall,

a handle including a ring intermediate the ends of the neck portion which is integral with and which extends substantially about the neck portion that remains substantially constant in size during expansion, and

a projection positioned substantially within the breadth of the container which has a substantially horizontal portion integral with and extending from said ring, and a substantially vertical portion depending from said horizontal portion that has attachment means thereon which coact with said integral attachment means on said sidewall for



affixing said depending portion thereto, to thereby provide a handle for gripping, lifting and pouring, wherein the stresses resulting therefrom are distributed about said ring.

4,372,455

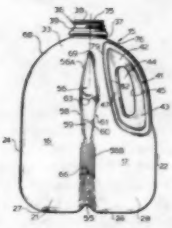
THIN WALLED PLASTIC CONTAINER CONSTRUCTION

Donald D. Cochran, Bartlett, Ill., assignor to National Can Corporation, Chicago, Ill.

Continuation of Ser. No. 113,176, Jan. 18, 1980, abandoned. This application Nov. 4, 1981, Ser. No. 318,051

Int. Cl.³ B65D *1/02*

U.S. Cl. 215—100 A **62 Claims**



1. A one-piece molded plastic container construction having:

four upstanding sidewall portions symmetrically located about a common longitudinal axis,

curved corner portions interconnecting adjacent side edge areas of respective sidewall portions,

a bottom portion,

curved base portions interconnecting adjacent bottom edge areas of respective said sidewall portions with adjacent edge areas of said bottom portion,

a hollow handle formed generally in a region extending along a first of said curved corner portions and generally within the profile thereof, the portion of said handle intermediate the end portions being spaced by an aperture from a panel section which extends between the pair of sidewall portions adjoining said first curved corner portion,

a top portion having a mouth region, which mouth region is coaxial with said longitudinal axis, said top portion being interconnected with adjacent top edge areas of respective sidewall portions,

the upper end areas of said handle and said panel section being each interconnected with said top portion and the lower end area of said handle being interconnected with an upper portion of said first curved corner portion, and

first and second ribbing structures, each one thereof being respectively defined longitudinally in opposed second and third said curved corner portions adjacent said first curved corner portion, each one of such ribbing structures including two matching ridge line members, each such

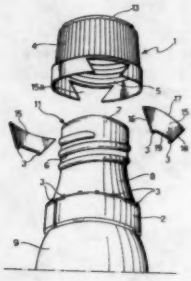
ribbing structure extending in its respective associated curved corner portion approximately from a position in said top portion in spaced relationship to said mouth region at least to the top edge areas of said curved base portions, and each such ribbing structure having its respective two ridge line members spaced laterally from one another therealong, this lateral spacing is at a maximum in a location which is situated generally between said bottom edge areas of said top portion and said lower end area of said handle.

4,372,456

SECURITY CLOSURE FOR BOTTLES

Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala S.p.A., Corso Romita, Italy

Filed Jul. 1, 1981, Ser. No. 279,480
Claims priority, application Italy, May 28, 1980, 22366 A/80
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 5 Claims



1. Security closure for a bottle having a neck with an annular flange adjacent its mouth and external screw-threading between the flange and the mouth, said closure comprising a cap with a lateral wall, which is screwed on to the bottle neck; a ring engaged with the annular flange of the neck, and a plurality of links interconnecting the ring and the free edge of the wall of the cap, said links being breakable when the cap is rotated and displaced axially relative to the ring upon opening of the bottle wherein the improvement consists in said lateral wall of the cap having at least one portion adjacent its free edge which is separate from the remainder of said wall and is connected to said ring by at least one of said breakable links.

4,372,457

CLOSURE CAP HAVING PRIZE MARKINGS AND PEELABLE LINER

Go Kunimoto, Chigasaki; Isao Ichinose, Hiratsuka; Noboru Suzuki, Fujisawa, and Fumio Mori, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Nov. 26, 1979, Ser. No. 97,370
Claims priority, application Japan, Nov. 25, 1978, 53-144968; Jul. 18, 1979, 54-090334
Int. Cl.³ B65D *53/04*
U.S. Cl. 215—228 14 Claims

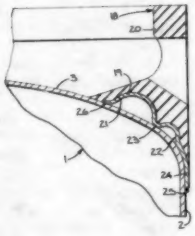
1. A closure cap comprising a cap shell, a liner adhered to the inside surface of said shell through a plurality of adjacent coating layers having peelable interfaces therebetween and an ink layer containing printed matter on one of said coating layers and positioned between two adjacent coating layers; the improvement comprising in that said liner has a starting portion for initiating peeling of the liner from the cap shell, in that the coating layer adjacent said liner comprises a topmost layer, in that a coating layer adjacent said topmost layer comprises an intermediate layer having said ink layer thereon, in that the peel resistance between said topmost layer and said intermediate layer is less than the peel resistance between the topmost layer and said liner, in that the coating layer adjacent said intermediate layer on the opposite side thereof from the topmost layer comprises a bottommost layer, and in that the peel resistance between said adjacent coating layers adjacent said starting portion is less than the peel resistance between adjacent coating layers further away from said starting portion.

4,372,458

PROTECTIVE SKIRT ASSEMBLY FOR A CONTAINER

Franklin J. Carlson, 1081 Wisconsin Ave., Okauchee, Wis. 53069

Continuation-in-part of Ser. No. 146,750, May 5, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 301,516
Claims priority, application Canada, Apr. 8, 1981, 374959
Int. Cl.³ B65D *25/24, 25/30*
U.S. Cl. 220—71 6 Claims



1. A tank construction, comprising a metal tank having a dome-shaped head, a sheet metal ring contoured to complement the peripheral edge portion of the head and having an outer surface and an inner surface, said ring also having an inner peripheral edge and an outer peripheral edge, a weld connecting at least one of said peripheral edges to said head, said ring having an annular outwardly extending convolution spaced from said peripheral edges, and a molded resilient skirt bonded to the outer surface of said head and completely enclosing said convolution.

4,372,459

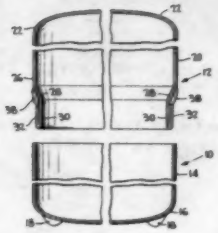
ANNULAR SEAM BETWEEN TWO CONTAINER BODY HALVES

Fred C. Newman, La Grange, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 12, 1980, Ser. No. 215,602
Int. Cl.³ B23P *11/02*
U.S. Cl. 220—76 5 Claims

1. An annular seam between two thin wall container halves, said seam comprising a first container half open end portion of a generally cylindrical configuration and terminating in a free edge, a second container half open end portion; said second container half open end portion including an axially displaced generally cylindrical part of the same size as said first container half open end portion; a generally frustoconical transition part joining a radially displaced generally cylindrical sleeve part to said axially displaced generally cylindrical part, said sleeve part being radially offset from said first container half open end portion, and a reversely turned hem carried by said sleeve part and on the side of said sleeve part facing away from the direction of radial displacement of said sleeve part, said hem termi-

nating in a free edge, said axially displaced generally cylindrical part, said transition part, said sleeve part and said hem combining to define an annular chamber; an adhesive in said annular chamber in engagement with said hem free edge in sealing relation, said first container half open end portion being telescoped relative to a part of said second container half open



end portion in sliding engagement with said hem and with said free end thereof aligned with said second container half generally cylindrical part and in axially opposed relation to said transition part, and a portion of said adhesive filling the space between said first container half free end and said transition part and in engagement with said first container half free end in sealing relation.

4,372,460

OIL-RESISTANT CLOSURE SYSTEM

Wilfred R. Brochman, Oakdale; Rodney R. Hannula, Maplewood, and Bradley H. Jorgensen, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 18, 1981, Ser. No. 264,833
Int. Cl.³ B65D 51/22
U.S. Cl. 220—258 **12 Claims**

1. An easy opening closure system comprising a container end portion having an opening therein, said closure system further comprising:

(a) an exterior tape comprising a backing and a pressure sensitive adhesive layer, said exterior tape being situated circumjacent said opening and being firmly adhered to the top surface of said container end portion circumjacent said opening by means of said pressure-sensitive adhesive layer; and

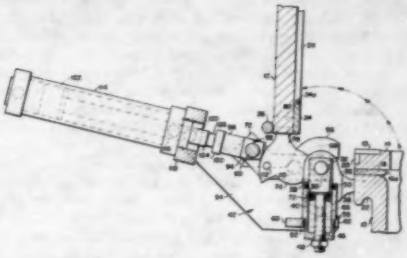
(b) a protective tape comprising a barrier layer and an oil-resistant thermoplastic adhesive layer firmly bonded to said barrier layer, said protective tape being firmly bonded to the bottom surface of said container end portion circumjacent said opening by means of said thermoplastic adhesive layer, and further being firmly bonded to said exterior tape in the area of said opening by means of said pressure-sensitive adhesive layer and said thermoplastic adhesive layer.

4,372,461

COVER BALANCE ASSEMBLY AND GASKET PROTECTOR DEVICE

Michael J. Lerman, Edison, and William Zamory, Somerville, both of N.J., assignors to De Dietrich (USA) Inc., Union, N.J.

Filed Dec. 2, 1981, Ser. No. 326,516
Int. Cl.³ B65D 17/50, 41/02, 43/24
U.S. Cl. 220—260 **15 Claims**



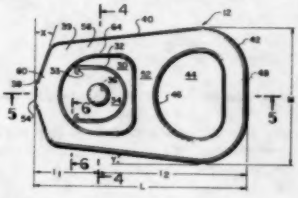
1. A vessel formed by a closed-wall structure including a nozzle providing an entryway to the interior of said structure, a cover movable from a position at which it is juxtaposed said entryway to and from positions either to seal said entryway or to open said entryway, a pair of lugs, said lugs being mounted on said vessel in spaced relation, each lug extending from said vessel and formed with an elongated vertical opening, a pin extending through said openings in said lugs, hinge means mounted on said cover and received on said pin for movement of said cover pivotally to and from said entryway open positions, and means acting between said lugs and pin exerting a constant force urging said pin upwardly in said vertical openings whereby said cover may locate to said juxtaposed position providing a clearance between said cover and nozzle at least within the region between said lugs under conditions that said cover is out of sealing engagement.

4,372,462

RETAINED RING TAB

Karl O. Dassler, Algonquin, and Neal E. Langseder, Rolling Meadows, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed May 12, 1981, Ser. No. 262,926
Int. Cl.³ B65D 17/34
U.S. Cl. 220—269 **8 Claims**



7. A lever tab for easy open ends comprising:

(a) a pair of dog leg levers disposed symmetrically about a longitudinal axis, each lever including an upper planar flange and a lower planar flange said planar flanges being parallel one to the other and at least 0.050" in width and wherein said flanges are joined by a curl with a radius of 0.030" and wherein said levers are formed with a short forward leg and a long lateral leg with said forward legs joined together to form the nose of said tab with an included angle therebetween of 150° and wherein said lateral legs are inclined at an angle of 3° to said longitudinal

axis with the included angle between said forward leg and said lateral leg of 108°,

(b) a raw edge at said nose and being in the plane of said upper planar flange in the area where said forward legs joined together and said nose including portions about said raw edge in the plane of said lower planar flange for contact with an end;

(c) a web joining said levers, the forward portion of said web being recessed to form a deboss panel with ascending walls inclined at an angle of about 60° to said deboss panel, said ascending walls joining said upper flange with said deboss panel to strengthen and buttress said upper flange against collapse and wherein said deboss panel is lanced to form a tongue for attachment in the plane of said lower planar flange to hold the portions of said nose against an end and wherein the rear portion of said web is apertured to provide a finger hole;

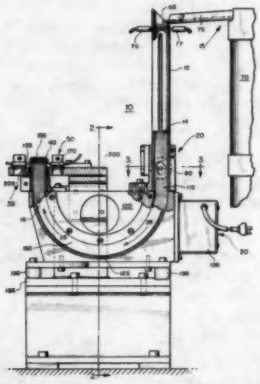
(d) a tab lift disposed rearward of said tab nose and transversely to said longitudinal axis, the extremities of said lift joining said lateral legs to form a pentagonal tab with a narrow nose and wide lift; and

(e) said tongue attachment being less than half as far as from said lower flange portions about said edge than said lift.

4,372,463
APPARATUS AND METHOD FOR FEEDING THIN PARTS

Patrick D. Notarione, Sagertown; Ronald K. Turk, and Gerald Grafius, both of Erie, all of Pa., assignors to Swanson-Erie Corporation, Erie, Pa.

Filed Nov. 26, 1980, Ser. No. 210,853
Int. Cl.³ B65H *1/30*
U.S. Cl. 221—10 **15 Claims**



1. An apparatus for feeding and positioning thin parts comprising:

a tube for containing a plurality of thin parts in a stack arrangement, having a loading end and a dispensing end, the length of said tube being J-shaped and mounted in a vertical position;

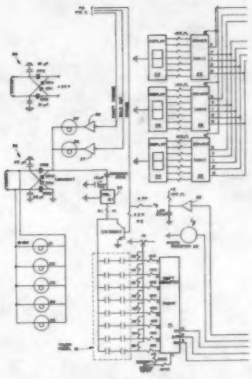
means disposed at said dispensing end of said tube for separating at least one of said parts from the remainder of said plurality of parts and positioning said part at said dispensing end of said tube, said separating means being disposed about the length of said J-shaped tube defining said dispensing end; and

means for feeding said plurality of parts from said loading end to said dispensing end, said feeding means including brake means disposed about the length of said J-shaped tube opposite said dispensing end to control movement of said parts along at least a portion of the length of said tube, sensing means disposed near said dispensing end for measuring the number of parts located at said separating means, and means for vibrating at least a portion of said J-shaped tube, said sensing means periodically releasing said brake means when the number of parts located at said separating means falls below a predetermined amount, such that said parts flow along said tube to said separating means, said sensing means re-engaging said brake means when the number of parts located at said separating means reaches the predetermined amount.

4,372,464
VENDING MACHINE CONTROL CIRCUIT

David M. Otten, Newton, Mass., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,625
Int. Cl.³ G07F *9/02*
U.S. Cl. 221—14 **9 Claims**



1. A vending machine control circuit, comprising:

a. a plurality of switch means for enabling a customer to indicate his choice of a product to be vended;

b. logic means, coupled to said plurality of switch means and being responsive thereto, for controlling the vending of products by the generation of vend signals;

c. a plurality of vend actuation means, responsive to said vend signals from said logic means, for vending a plurality of products;

d. a plurality of out-of-product switches, each switch having a pair of cooperating contact elements and one switch being provided for each vend means with its electrical contact elements being electrically connected in series with the vend means and being opened by the absence of product for that vend means, such that each switch prevents current from flowing through its associated vend means when an out-of-product condition exists therefor; and

e. a common current sensing circuit for all of the vend means for detecting current flowing through each vend means when it is activated by said logic means, whereby the absence of current flowing through a vend means when the vend signal is generated therefor indicates the out-of-product switch associated with that vend means is open and an out-of-product condition exists therefor.

4,372,465
COUNTER DISPENSER FOR CONES

Candace J. Alcorn, 3697 W. Valley Green, Ft. Lauderdale, Fla. 33328

Filed Dec. 31, 1980, Ser. No. 221,702
Int. Cl.³ B65D *88/54*
U.S. Cl. 221—131 **13 Claims**

9. A dispenser for generally cone-shaped articles stacked in

a plurality of adjacent stacks in a vertically elongated shipping container having a rectangular external cross-section between its top and bottom, said dispenser comprising:

an open-topped housing having a rectangular internal cross-section substantially complementary to the external cross-section of said shipping container for slidably receiving the latter;

means for mounting said housing in an opening in a counter top with said housing extending down from the counter top;

a follower plate mounted for vertical movement within said

housing and shaped and dimensioned to move freely along the inside of the shipping container when the latter is received in said housing with its top and bottom open;

a spring under compression below said follower plate urging the follower plate upward to push the stacks of generally cone-shaped articles up along the inside of said container;

and a retainer disposed generally flush with the top of and extending across the top of said housing and defining openings aligned with the stacks of articles through which the articles may be pulled up manually, said retainer presenting flexible and resilient fingers adjacent said openings for holding down the uppermost articles.

4,372,466

VESSEL FOR STORING PARTICULATE MATERIALS AND METHOD OF EMPTYING

Andre Reimbert, 67, Boulevard de Reuilly, F-75012 Paris, France

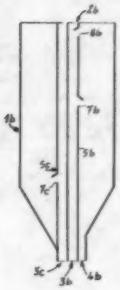
Filed Nov. 20, 1980, Ser. No. 208,637

Claims priority, application France, Nov. 21, 1979, 79 28683

Int. Cl.³ B65G 65/34

U.S. Cl. 222—482 **8 Claims**

1. A vessel for the storage of materials in granular or powdered form in which a bottom discharge opening is formed in the lower end of said vessel and fitted with a shut-off valve, wherein the lower end of said vessel is provided with a second discharge opening fitted with a shut-off valve, there being connected to said second discharge opening a vertical emptying tube which extends within the vessel and the top orifice of which is located at a level between ¼ and ¾ of the total height of the vessel, said level being such that, at the time of final emptying of the lower portion of the vessel through the discharge opening in the lower end of said vessel, the curve of overpressures resulting from said emptying operation is close



to the curve of static pressures generated by all the material stored within the vessel when said vessel is full.

4,372,467

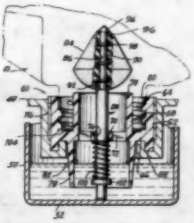
DISPENSING VALVE TO BE USED WITH BOTTLES OF FLUENT IMAGING MATERIAL FOR THE DEVELOPMENT OF ELECTROSTATIC IMAGES

Frederick J. Pritchitt, Kingston, N.Y., assignor to Marpac Industries, Inc., Kingston, N.Y.

Continuation-in-part of Ser. No. 157,510, Jun. 9, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,379

Int. Cl.³ B65D 47/06

U.S. Cl. 222—501 **3 Claims**



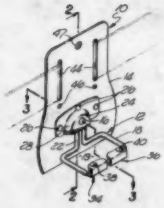
2. A dispensing valve to be used on a supply bottle containing a fluent imaging material adapted to be employed in an electrostatographic copying machine, said bottle including a male half of a coupling means, said valve comprising:

(A) a valve cap having a skirt that is provided internally with a female half of a coupling means adapted to mesh with the male half of the coupling means on the bottle neck,

(B) the valve cap having a central opening for passage of fluent imaging material from the bottle therethrough,
(C) a spider in said opening,
(i) the spider having a bore coaxial with the opening in the cap,
(D) a valve seat at the end of the central opening in the cap and facing the interior of the bottle,
(E) a plastic spindle extending through the bore in the spider,
(i) a flange molded in one piece with the spindle on the side of the spider remote from the valve seat,
(F) a helical compression spring under compression between the spider and the flange,
(G) the spindle having on the side of the spider remote from the spring a portion of reduced diameter to form a first shoulder where it joins the remainder of the spindle,
(H) the spindle further having a top portion above the seat and adapted to be received within the bottle when the dispensing valve is mounted thereon, said top portion being pointed and having a base with a diameter greater than that of the reduced diameter portion of the spindle to form with the reduced diameter portion of the spindle a second shoulder facing the first shoulder,
(J) a resilient centrally bored valve plug friction fitted on the reduced diameter portion of the spindle with its upper end butting against said second shoulder, and
(K) the reduced diameter of the spindle including at least one annular rib to engage the central bore of the valve plug and inhibit axial shifting of said plug.

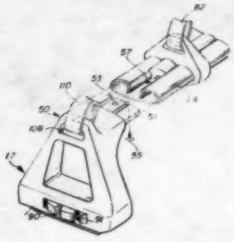
3. A dispensing valve as set forth in claim 2 wherein said rib has a steeply inclined side facing the spider.

4,372,468
TOOL HOLDER
Robert P. Harvey, Northridge, Calif., assignor to McGuire-Nicholas Manufacturing Company, Los Angeles, Calif.
Filed May 8, 1981, Ser. No. 261,911
Int. Cl.³ A45F 5/00
U.S. Cl. 224—268 6 Claims



1. A tool carrying device for supporting an implement of the type having an elongated handle and transverse head portion, said device comprising: a support backing; a tool support loop defining two extended open ends and being pivotally mounted on said backing such that said loop extends substantially perpendicularly with respect to said backing; a pair of gate members, one of said members being pivotally mounted on each of said open ends of said tool support loop; and means for biasing certain gate members to a position substantially parallel with said backing.

4,372,469
ARTICLE CARRIER HAVING VARIABLY POSITIONABLE CROSS-RAIL BRACKET
Daniel J. Kowalski, Ortonville, and Douglas J. Ferguson, Davisburg, both of Mich., assignors to Four Star Corporation, Troy, Mich.
Continuation of Ser. No. 24,994, Mar. 29, 1979, Pat. No. 4,245,764. This application Jun. 18, 1980, Ser. No. 160,804
Int. Cl.³ B60R 7/00
U.S. Cl. 224—321 2 Claims

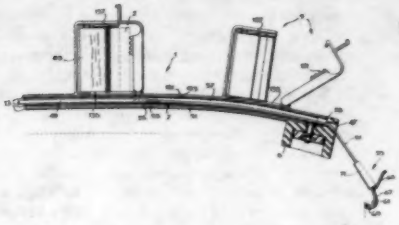


1. An article carrier for an automotive vehicle of the type including an elongated slat fixed to the vehicle exterior and extending longitudinally thereof, said slat having an upwardly opening guideway, a bracket having a base portion slidably retained in said guideway, means for adjustably clamping the bracket to the slat, the bracket having an upper portion which includes a cross-rail supporting section extending normally of the slat, and a cross-rail mounted upon the cross-rail supporting section, the improvement comprising:
(a) the cross-rail being of generally oval cross section wherein the maximum depth of the cross-rail is substantially less than its width, said cross-rail including
a continuous and upwardly curving bottom surface,
a downwardly curving upper surface and having an upwardly opening channel formed by a pair of side walls extending downwardly from said upper surface, said downwardly extending side walls terminating proximate the bottom surface of the cross-rail, said channel and side walls extending throughout the length of the cross-rail,
(b) the cross-rail supporting section of said bracket including an opening being generally of the same oval cross section as the cross-rail and adapted to telescopingly receive one end of the cross-rail.

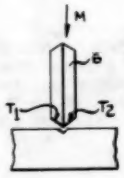
4,372,470
CAR RACK
Michel J. Dallaire, Montreal, Canada, assignor to Bic Corporation, Milford, Conn.
Filed Nov. 25, 1980, Ser. No. 210,341
Int. Cl.³ B60R 9/12
U.S. Cl. 224—324 32 Claims

1. A car rack adapted to be secured, at least in pairs, on the top of a car for carrying articles, comprising:
an elongated support base having support means resting on the top of the car for supporting said base spaced from said top,
resilient means extending longitudinally across said support base and captive in a channel thereof and adapted at their opposed ends to removably but solidly secure said support base on the top of the car, and
one or more carrying elements removably connected to said support base for carrying articles, each carrying elements being a reversed T-shaped element having a web and a transverse leg, one side of the leg being longer than the other side thereof, a tail portion integrally connected to the free end of said web and being perpendicularly bent with respect thereto, a bail element opposite said web and

connected to the long side of said leg, said bail element having locking means at its free end to engage with corresponding locking means provided at the free end of said bail portion, and a bumper element being connected to said reversed T-shaped element opposite said bail element.



4,372,471
GLASS CUTTING SYSTEM
Luis Galindez, Llodio-Alava, Spain, assignor to Vidrierias de Llodio, S.A., Spain
Continuation-in-part of Ser. No. 955,071, Oct. 26, 1978, abandoned. This application Oct. 17, 1980, Ser. No. 198,095
Int. Cl.³ B26F 3/00
U.S. Cl. 225—1 **1 Claim**



1. In a method of cutting a piece of glass with a rotary glass-cutter supported for rotation about a generally horizontal axis to move along a path relative to the piece of glass to be cut, the steps of

measuring the thickness of the piece of glass to be cut,

selecting a rotary cutter having a diameter substantially in the range of nearly equal to the thickness of said piece of glass to twice the thickness of said piece of glass,

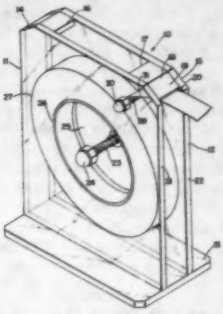
selecting a cutting angle on said rotary cutter equal to substantially

$$2 \times \text{arc sine}\left(1 - \frac{0.18}{\text{the thickness of the glass}}\right)$$

with the angle measured in sexagesimal degrees and the thickness of the glass measured in millimeters,

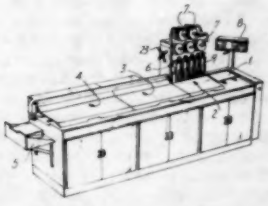
applying a constant pressure on said rotary cutter as it moves along the surface of said piece of glass in order to sever said piece of glass completely through its thickness along the line of cutting by a single stroke of said cutter along the surface of said piece of glass solely by the action of said cutter.

4,372,472
TAPE DISPENSER
Fred Herrmann, 330 Main St., Dickson City, Pa. 18519
Filed Apr. 3, 1981, Ser. No. 250,885
Int. Cl.³ B26D 1/02
U.S. Cl. 225—80 **12 Claims**



1. A dispenser for tapes comprising a base, a dispensing frame having a pair of spaced parallel like sidewalls upstanding from said base and each sidewall being substantially square in shape, a shaft between the centers of said sidewalls, a mounting disk on said shaft to carry a roll of tape thereon, a cutter edge at an upper corner of said housing and between said sidewalls, a rotatable roller having means thereon for defining a moving point contact and disposed above a radius extending from said center shaft to said cutter edge and closely spaced from the largest diameter of a roll of tape carried on said shafts and mounting disk, an adhesive side of said tape passing over said roller and below said cutter edge whereby the tape can be pulled out from the roll at an angle between 110° and 160° to a desired length outwardly of the dispenser and then cut by its non-adhesive side being moved upwardly against said cutter edge.

4,372,473
STITCHING ASSEMBLY
Alan S. Holdsworth, Broadstone, England, assignor to McCorquodale Machine Systems Limited, Basingstoke, England
Filed Jan. 27, 1981, Ser. No. 229,022
Claims priority, application United Kingdom, Jan. 31, 1980, 8003351
Int. Cl.³ B27F 7/02
U.S. Cl. 227—3 **15 Claims**



1. A stitching assembly for stitching together sheets of paper, card, and similar materials comprising:

a plurality of stitching machines, each of said stitching machines including a stitching head, a clinch block, and means connecting together said stitching head and said clinch block to form a unitary stitching machine;

a frame;

means mounting said plurality of stitching machines on said frame for movement along said frame as a complete unit;

a code bar assembly, said code bar assembly including a plurality of code bars and co-operating means on said code bars distributed along the length of said code bars, the spacing of the co-operating means on each of the code bars being different from that upon each other of the code bars, and, means to move said code bars; and,

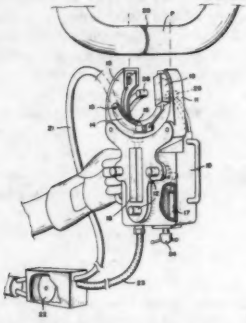
co-operating means on the said stitching machines, said co-operating means on said stitching machines co-operating with said co-operating means on said code bars to locate said stitching machine at predetermined positions along said frame, said predetermined position being determined by said spacing of said co-operating means along said code bar adjacent said stitching machines, said means to move said code bars enabling a selected one of said code bars to be associated with said co-operating means on said stitching machines whereby the spacing of said stitching machines along said frame is variable.

4,372,474

FULL FUNCTION IN-PLACE WELD HEAD

James T. Taff, Simi Valley, Calif., assignor to Dimetrics, Inc., Diamond Springs, Calif.

Filed Nov. 28, 1980, Ser. No. 211,359
Int. Cl.³ B23K 9/00
U.S. Cl. 228—29 **6 Claims**



1. A full function, in-place weld head including, in combination:

(a) a pipe clamping structure having spaced clamping shoes for engaging and clamping an in-place pipe to hold the structure stationary relative to said pipe;

(b) a welding mechanism surrounding a portion of the pipe adjacent to said pipe clamping structure;

(c) parallel movement control means coupling said welding mechanism to said clamping structure for guided back and forth movement in an axial direction along said pipe relative to said clamping structure, said parallel movement control means including three rotatably mounted screws in said clamping structure having axes extending from points defining the vertices of an equilateral triangle in directions extending from the clamping structure parallel to and below the axis of a pipe held in the clamping structure, said welding mechanism having three fixed threaded nuts in positions to receive said screws; a central gear in said clamping structure and three outer gears at said points secured to said screws to rotatably mount the same, said three outer gears being in threaded engagement with said central gear so that rotating any one of the gears will rotate all the other gears to effect said guided back and forth movement;

(d) a horseshoe-shaped weld head supporting rotor mounted in said welding mechanism for rotational movement in its own plane over 360° about a pipe received therein;

(e) a link plate pivoted to one side of the horseshoe-shaped rotor;

(f) a welding torch head mounted on said link plate such that swinging movement of said link plate about its pivot moves said torch head in a generally normal direction further from and closer to the axis of said pipe;

(g) a first motor in said pipe clamping structure coupled to rotate one of said gears of said parallel movement control means and constituting a reversable motor so that by periodically reversing the direction of rotation of one gear, the welding mechanism is caused to oscillate towards and away from the clamping structure to thereby effect movement of the torch head back and forth across the weld path;

(h) a second motor on said welding mechanism for rotating said weld head support rotor; and

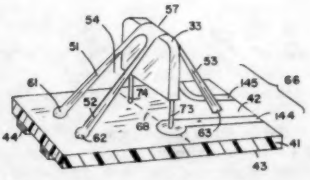
(i) a third motor carried on said weld head support rotor for swinging said link plate about its pivot point, whereby programmed operation of said first, second and third motors enables oscillating the torch head back and forth on either side of the weld path as a 360° weld path is followed about the pipe held in said clamping structure and wherein the torch head can be moved towards and away from the weld path as required for arc gap voltage control so that there is automatically provided a controlled high quality weld about the pipe.

4,372,475

ELECTRONIC ASSEMBLY PROCESS AND APPARATUS

Melvin L. Goforth, 7619 Hermosa, Amarillo, Tex. 79108, and Richard G. Russell, 6607 Roxton, Amarillo, Tex. 79109

Filed Apr. 29, 1981, Ser. No. 258,586
Int. Cl.³ H05K 3/34
U.S. Cl. 228—170 **9 Claims**

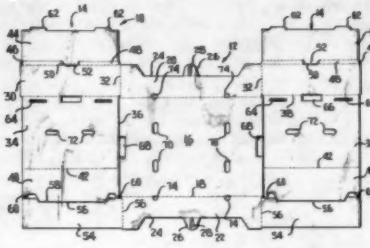


1. An electronic assembly process comprising a first stage wherein a solution of fabric forming material is formed and applied to a positioned array of electrical components on a printed circuit board, a second stage in which a component holding and positioning fabric is attached to said positioned array of electrical components on said printed circuit board, a third stage in which an array of external leads of said electrical components held by said fabric to said printed circuit board are soldered to portions of patterns of conductive elements on the surfaces of that printed circuit board, a fourth stage in which the assembly of component holding and positioning fabric and electrically connected components and printed circuit board is located in a body of fluid to dissolve said fabric, and a fifth stage in which stage the connected assembly of electric components and circuit board free of said fabric is removed from said fluid.

4,372,476
SELF-LOCKING TRAY WITH INTEGRAL DIVIDER

Frederich C. Harned, Martinez, and Scott M. Galloway, Augusta, both of Ga., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Sep. 9, 1980, Ser. No. 185,476
Int. Cl.³ B65D 5/08
U.S. Cl. 229—16 A **5 Claims**

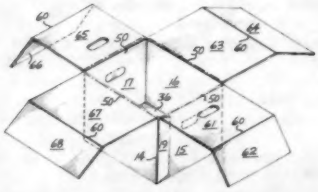


1. A blank for a tray, said blank comprising a central portion and end portions which are alike, said central portion including a base panel said having side panels along two opposite edges thereof, and said end portions each being free of said base panel and having parts joined to each of said side panels, each end portion including a bottom panel and a partition panel both directly alongside and coextensive with an end of said base panel.

4,372,477
CONTAINER

Richard Wytko, Olympia, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 284,426, Jun. 20, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 383,390
Int. Cl.³ B65D 5/10, 5/22
U.S. Cl. 229—39 R **4 Claims**



2. A container comprising a first, second, third and fourth panels serially connected by score lines,

means for connecting said first and fourth panels,

two of said first, second, third and fourth panels being opposed side walls of the container,

the other two of said first, second, third and fourth panels being opposed front and back walls of the container,

a bottom closure extending along the lower edge of said first, second, third and fourth panels,

said bottom closure including opposed truncated panels extending from said opposed side walls and opposed rectangular panels extending from said front and back walls respectively, each said rectangular panel extending beyond the major axis of the container bottom and includes a converging recess at the midpoint of its outer free edge and a diagonal score line extending inwardly from said recess thereby forming a fold back section, said fold back sections adhesively secured to the adjacent truncated panel, said bottom panel being secured with the engagement of said recesses,

a front reinforcing panel hingedly attached to the upper edge of said front panel extending into said container in contact with the inner face of said front panel,

side reinforcing panels hinged to the upper edges of said side panels and extending downwardly into the container in contact with the inner face of said side panels, and

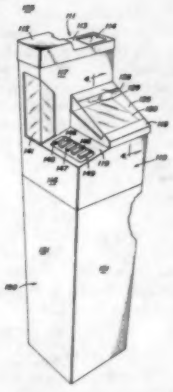
a back reinforcing panel hingedly attached to the upper edge of said back panel extending into said container in contact with the inner face of said back panel, and

bottom reinforcing panels hinged to the lower edges of said front, back and side reinforcing panels, each said bottom reinforcing panel being rectangularly shaped and of equal length and extending normal to respctive front, back and side reinforcing panels a distance such that opposed bottom reinforcing panels overlap each other.

4,372,478
FARE COLLECTION SYSTEM AND COMPONENTS THEREOF

Jim H. Gomez, Kankakee, and Jose E. Davila, Bourbonnais, both of Ill., assignors to General Railway Signal Company, Rochester, N.Y.

Division of Ser. No. 855,970, Nov. 30, 1977, Pat. No. 4,210,801. This application May 14, 1980, Ser. No. 149,145
Int. Cl.³ G07B 15/00
U.S. Cl. 232—12 **11 Claims**



1. A fare box for use in a fare collection system having a central processing unit with an extractor conduit having one end in communication therewith and an extractor coupling on the other end thereof, said fare box comprising a pedestal open at the upper end and having a top closing the upper end, said pedestal having a coin collection chamber for receiving coins therein and a paper collection chamber for receiving paper therein, said top having a coin receiving slot therein communicating with said coin collection chamber and a paper receiving slot therein communicating with said paper collection chamber, coupling structure in said pedestal for cooperating with the extractor coupling to provide communication between said chambers and the central processing unit for conveying the contents of said chambers to said central processing unit, a gate operable in one position thereof to separate said coin collection chamber from said coupling structure and in another position thereof to permit passage of coins from said coin collection chamber to said coupling structure, and mechanism for shifting said gate from said one position to said other position upon the termination of the conveying of the contents from said paper collection chamber.

4,372,479

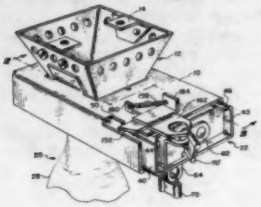
SELF-LOCKING COVERED COIN RECEPTACLE AND AUTOMATIC RESET MECHANISM THEREFOR

August M. Sciortino, 1838 Weeg Way, Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 136,889, Apr. 3, 1980, Pat. No. 4,359,184. This application Feb. 26, 1981, Ser. No. 238,617

Int. Cl.³ G07B *15/00*

U.S. Cl. 232—15 20 Claims



1. In a self-locking cover assembly for a coin receptacle mountable within a channeled bracket which is secured in communication with the coin delivery chute of a coin operated machine, the self-locking cover assembly including first and second channeled members telescopically engaged, the first channeled member having a window alignable with the delivery chute and a latch assembly, said first channeled member having slide means seated for slidable movement within the cover for selectively covering and uncovering the window, first spring means operable within the cover to bias the slide means in window covering condition and second spring means operably seated within the cover assembly selectively to block movement of the slide means whereby to prevent uncovering of the window when the covered receptacle is withdrawn from the channeled bracket, the invention comprising reset means automatically operable to release said second spring means subsequent to operation thereof for the purpose of preventing uncovering of the window, said reset means comprising cam means on one of the second spring means and first channeled member for displacing said second spring from a blocking condition blocking movement of said slide means and follower means on the other one of said second spring means and first channeled member interceptable by said cam means during withdrawal of said channeled members from their full telescopic engagement subsequent to withdrawal of the cover from the channeled bracket in locked condition.

4,372,480

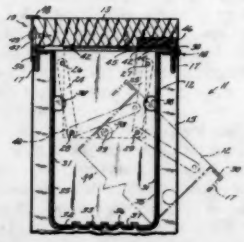
TILT-OUT BOX FOR MAIL AND THE LIKE

Terry L. Mitchell, 6880 Belhurst, Jenison, Mich. 49428, and Robert L. Russell, 1193 48th, SE., Kentwood, Mich. 49508

Filed May 1, 1981, Ser. No. 259,677

Int. Cl.³ B65D *91/00*

U.S. Cl. 232—28 8 Claims



4. A tilt-out box structure for mail and the like for suspension between a pair of spaced-apart vertical supports and beneath a horizontal cover plate spanning the gap between said vertical supports comprising:

an elongate box having end plates closing each end of said box, said box being open at the top and including a front and rear downturned flange for the entire length of the box;

a pair of pivot arms at each end of said box and having pivot connecting means at each end, the upper ends of said pivot arms being pivotally connected to said box ends in spaced-apart relation and movable with movement of said box;

a mounting plate adjacent each end of said box having an upper connecting flange and pivotally attached to the lower ends of said pivot arms, said mounting plate having means for attaching in place; and

selectively operable latches one at the front of said box and one at the rear of said box for securing said box in position in respect to a support structure and selectively disengageable to open said box forwardly or rearwardly in a compound arcuate and tilting path determined by said pivot arms.

4,372,481

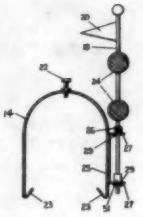
MAILBOX MARKING ATTACHMENT

Ronald K. Benson, Rte. #2, Montague, Mich. 49437

Filed Nov. 23, 1979, Ser. No. 96,903

Int. Cl.³ B65B *91/00*

U.S. Cl. 232—34 3 Claims



1. An auxiliary mailbox marking attaching for attachment to a mail receptacle having a top, sides, and a bottom, the mailbox marking attachment comprising:

a mounting member that fits transversely over the exterior top and sides of the mail receptacle, with a lower portion of the mounting member extending inwardly at least partially beneath the mail receptacle, the mounting member comprising a strap device that fits over and generally conforms in shape to the exterior of the mail receptacle, the strap having inwardly angled lower ends that fit under lower edges of the mail receptacle;

tightening means for tightening the strap device so it is held tightly in position on the mail receptacle;

flagpole mounting means attached to the side of the strap device for releasably attaching a flagpole to the mailbox, the flagpole mounting means comprising a bracket having a back attached to the strap and vertically spaced upper and lower tabs extending outwardly from upper and lower ends of the back, respectively, the tabs having aligned vertical openings therein; and

a flagpole releasably mounted in the flagpole mounting means, the flagpole extending downwardly through the opening in the upper tab and being releasably attached to a connector that is in turn releasably fixed to the lower tab by means of a threaded fastener that extends through the opening in the lower tab, the flagpole having a removed section therein above the upper tab, with a spring connecting the portions of the flagpole on each side of the removed section, the spring permitting the portion of the flagpole above the spring to be resiliently deflected downwardly with respect to the portion of the flagpole below

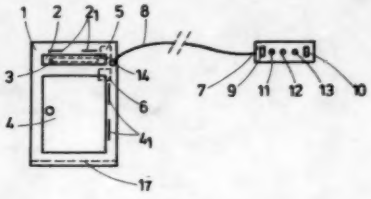
the spring, the lower portion of the flagpole being held in a fixed position by the flagpole mounting means.

4,372,482

INSTALLATION FOR SIGNALLING DEPOSIT OF MAIL IN A LETTER BOX

Jack J. V. Clerigues, 21, rue Bourdaloue, Nimes (Gard), France

Filed Jun. 16, 1981, Ser. No. 274,138
Claims priority, application France, Jun. 19, 1980, 80 13639
Int. Cl.³ B65D *91/00*
U.S. Cl. 232—36 **6 Claims**



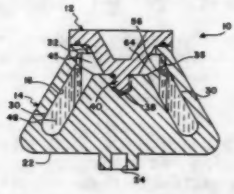
1. An installation for signalling the deposit of mail in a letter box (1), said letter box comprising a movable shutter member (2) in front of a mail insertion slot (3) and an access door (4) for removal of the deposited mail, characterised in that the shutter member and the door are each connected to an electrical switch means (5, 6) arranged to be actuated respectively when the shutter member is raised and when the door is opened, the switch means (6) associated with the door being disposed in the supply circuit of a relay having a first and a second switch, the first switch being disposed in a self-supply circuit of the relay in series with the switch means associated with the door, and the second switch being disposed in series in the supply circuit of a signalling means (11).

4,372,483

FLUID CONTAINMENT ANNULUS FOR FIXED ANGLE ROTORS

Herschel E. Wright, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 29, 1981, Ser. No. 268,540
Int. Cl.³ B04B *7/02, 7/08*
U.S. Cl. 494—16 **4 Claims**



1. A centrifuge rotor comprising:

a lower rotor portion with an upper open end;

means within said lower rotor portion for receiving and supporting a plurality of centrifuge tubes at a fixed angle with respect to the spin axis of said rotor, said receiving and supporting means designed to contain a specified amount of a fluid sample in said each of said tubes;

means for forming an enclosed area around the perimeter of said open end of said lower rotor portion, said enclosed area forming means capturing any of said fluid sample from said tubes which is in excess of said specified amount during centrifugation; and

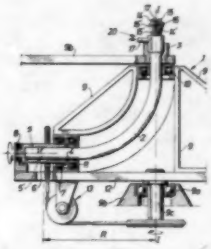
a lid for covering said open end of said lower rotor portion, said enclosed area forming means being positioned adjacent said lid in such a manner that none of said fluid sample in excess of said specified amounts being retained in said area contacts said lid during centrifugation.

4,372,484

DEVICE FOR THE SEPARATION OF A LIQUID, ESPECIALLY WHOLE BLOOD

Lars-Ake L. Larsson, Loddekopinge, Sweden; Claes-Ake Gullberg, Hechingen, Fed. Rep. of Germany; Kaj Stenberg, Staffanstorp, and Nils G. E. Boberg, Lund, both of Sweden, assignors to Gambro AB, Sweden

PCT No. PCT/SE79/00128, § 371 Date Feb. 4, 1981, § 102(e) Date Feb. 4, 1981, PCT Pub. No. WO80/02653, PCT Pub. Date Dec. 11, 1980
PCT Filed Jun. 6, 1979, Ser. No. 232,024
Int. Cl.³ B04B *11/00*
U.S. Cl. 494—14 **23 Claims**



1. Apparatus for separating a liquid, such as whole blood, into fractions having different densities, comprising

separating means for separating the liquid into its fractions, said separating means including a separation chamber;

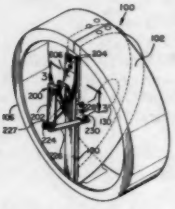
transferring means in fluid communication with said separation chamber of said separating means for transferring the liquid to said separation chamber and for individually transferring the liquid fractions from said separation chamber, said transferring means including supplying means for supplying the liquid to said separation chamber, first discharging means separate and distinct from said supplying means for discharging a first liquid fraction from said separation chamber, and second discharging means separate and distinct from said supplying means and said first discharging means for discharging a second liquid fraction from said separation chamber, whereby the first and second liquid fraction may be individually discharged from said separation chamber by said first and second discharging means, respectively, said transferring means further including a first end which is stationary and a second end which is rotatable in a circular path around and at a distance from a first axis passing through said first end of said transferring means, said second end of said transferring means being fixedly connected to said separating means, whereby said separating means is rotatable conjointly with said second end of said transferring means about said first axis and about a second axis which is coincident with a medial longitudinal axis of said second end of said transferring means; and

rotating means for conjointly rotating said separating means and said second end of said transferring means about said first axis and for conjointly rotating said separating means and said second end of said transferring means about said second axis so as to prevent said transferring means from twisting as a result of its rotation about said first axis.

4,372,485
THERMALLY ACTIVATED, AUTOMATIC DAMPER AND DAMPER OPERATOR

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Filed Dec. 1, 1980, Ser. No. 211,914
Int. Cl.³ G05D 23/00; F23L 5/00
U.S. Cl. 236—1 G 15 Claims



1. For a damper having a frame and at least one reciprocal blade operatively associated therewith, an improved damper operator comprising:

a. a bimetallic element, a portion of which is fixedly connected to the frame; and

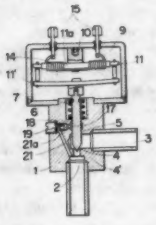
b. a link bar, pivotally connected to and between other portions of the bimetallic element and face portions of the blade of the damper;

so that reciprocating movement of the bimetallic element causes the blade to move within the damper frame.

4,372,486
REVERSIBLE EXPANSION VALVE

Soichiro Tomioka, and Yasuo Komiya, both of Iruma, Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Japan

Filed Apr. 22, 1981, Ser. No. 256,553
Claims priority, application Japan, Apr. 25, 1980, 55-55920[U]
Int. Cl.³ F25B 41/04
U.S. Cl. 236—92 B 7 Claims



1. A reversible expansion valve comprising

a valve body formed with a primary port, a secondary port, a valve seat defined between the primary and secondary ports, and a slide bore in an opposing relation to said valve seat;

a valve needle inserted through said slide bore and adapted to engage the valve seat;

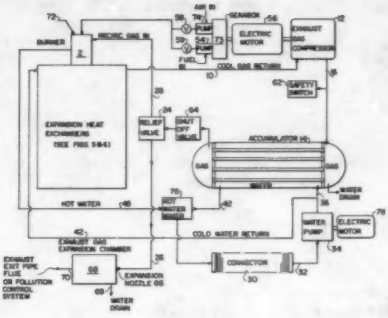
a control chamber accommodating a control means therein to regulate the valve needle; and

means for protecting against fluid leakage into said control chamber, comprising a communication passage provided between said primary port and said slide bore and having a check valve therein.

4,372,487
HIGH PRESSURE OIL/GAS FIRED CLOSED LOOP FURNACE

Charles W. Hollister, 32 Wiltshire La., West Hartford, Conn. 06117

Filed Nov. 26, 1980, Ser. No. 211,329
Int. Cl.³ F24D 3/00
U.S. Cl. 237—56 6 Claims



1. Furnace structures having smoke and gas return, comprising:

(a) combustion chamber means generating combustion gases containing heat of combustion;

(b) heat exchanger means surrounding said combustion chamber means and directing said combustion gases away from said combustion chamber means;

(c) convector means for delivering heat to the inside of a dwelling;

(d) means for circulating heat transfer medium parallel to and contiguous with said heat exchanger means countercurrent to said combustion gases, transferring said heat of combustion and delivering said heat of combustion to said convector means including a first pump;

(e) means for recirculating a first portion of said combustion gases from said heat exchanger means to said combustion chamber means including a second pump compressing and circulating said combustion gases and a second portion of said combustion gases as waste product;

(f) means for accumulating said combustion gases from said heat exchanger means and means for circulating said heat transfer medium through said means for accumulating; and

(g) said means for recirculating including a relief valve connecting a first conduit to said combustion chamber and a second conduit to waste product.

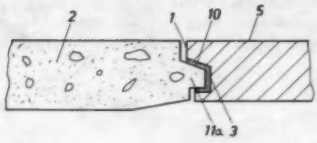
4,372,488
LEVEL CROSSING FOR RAILROADS AND METHOD OF FABRICATING THE SAME

Karl Schönthaler, Bad Ischl, and Gerhard Hartl, Vienna, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Filed Mar. 20, 1975, Ser. No. 560,500
Claims priority, application Switzerland, Mar. 20, 1974, 3887/74
The portion of the term of this patent subsequent to Feb. 8, 1999, has been disclaimed.
Int. Cl.³ E01C 9/04
U.S. Cl. 238—8 10 Claims

3. A level crossing for a railroad having a pair of rails defining a track, comprising a roadway body located adjacent the rails, outer plates arranged between the rails and the roadway body, profiled closure means provided for the roadway body, the outer plates being supported at one side at the rails and at the other side at the profiled closure means, elastic molded

body means at the profiled closure means of the roadway body for providing positive support of the outer plates, said profiled closure means including at least one profile element, the outer plates being provided with adjustment screw means at the region of the profile element for changing the position of the outer plates, a groove having vertical walls formed in said



profile element, at least one metallic plate arranged between the adjustment screw means and said elastic molded body means, said metallic plate and said elastic molded body means being located in said groove, and an elastic band arranged between the vertical walls of said groove and said elastic molded body means.

4,372,489

ELECTRICAL TOY VEHICLE TRACKS

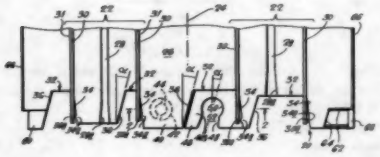
Cheuk-Ming Lee, Hong Kong, Hong Kong, assignor to The Refined Industry Company Limited, Hong Kong, Hong Kong

Filed Aug. 1, 1980, Ser. No. 174,337

Claims priority, application United Kingdom, Aug. 8, 1979, 7927609

Int. Cl.³ A63H *18/12, 19/30;* **E01B** *23/00*

U.S. Cl. 238—10 F **11 Claims**



1. A toy vehicle track section capable of being joined to the end of a like track section to assemble a vehicle track, said section comprising:

means forming at least one defined path for a vehicle including at last two electrically-conducting strips from which a vehicle obtains electrical power,

said strips being substantially straight throughout their lengths and extending from end to end of said section substantially parallel to one another and to the longitudinal axis of said section, an individual tapered recess adjacent the end of each said electrical strip, respectively, at each end of said section, said end of each strip terminating in its said individual recess so that each recess houses an end of a respective strip, each recess tapering width-wise of said section in a direction away from the respective end of said section, each recess being defined by an abutment wall adjacent the end of the respective strip and a cam wall inclined relative to the longitudinal axis of said section, said cam wall being adapated for engaging a corresponding cam wall on the end of another, adjacent section when the sections are brought together to cause the ends of the strips adjacent to the cam walls of the two sections to be moved into side by side engagement with each other between said respective pair of abutment walls, the ends of said strips of the two sections being substantially straight when the sections are brought together, and

snap-fitting retaining means at each end, respectively of said section, for releaseably connecting the section with an adjacent section, said snap-fitting means comprising means defining an open ended mouth having a restricted opening and a lug extending transversely of the path, said lug being capable of entering the mouth of an adjacent section through the opening of the mouth when the sections are brought together and being releasably held in said mouth after the sections have been brought together, one of said defining means and said lug being resilient, the longitudinal axis of said mouth and thereby the direction in which said lug of said section enters and leaves said mouth of the adjacent section being generally parallel to said cam wall of said section.

4,372,490

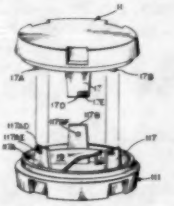
PULL PAD CONCENTRATED AIR DEODORIZER

Robert A. Le Caire, Jr., Appleton, and David W. Wendt, Madison, both of Wis., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 20, 1980, Ser. No. 208,574

Int. Cl.³ A61L *9/00*

U.S. Cl. 239—59 **39 Claims**



1. A container for a deodorant having first and second housing sections which are telescopically joined together for reciprocal movement with respect to each other between a fully open position and a closed position, air passages being defined between said housing sections in the container open position, said air passages extending into the interior of said container and said air passages being sealed off in the container closed position, the improvement comprising:

index means for varying the size of said air passages in response to reciprocal movement of said housing sections with respect to each other; and

locking means for locking said housing sections in said closed position in response to rotation of said housing sections with respect to each other;

said index means including a plurality of outwardly projecting engaging legs extending from said first housing section and said second housing section.

4,372,491

FUEL-FEED SYSTEM

Semyon I. Fishgal, 1908-35 High Park Ave., Toronto, M6P 2R6, Canada

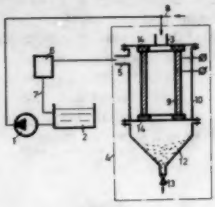
Filed Feb. 26, 1979, Ser. No. 14,848

Int. Cl.³ B05B *3/14*

U.S. Cl. 239—102 **2 Claims**

1. A fuel-feed system for engines, gas turbines, burners and the like, including a fuel-pressure source communicated with a reservour means and a flow-line filtration system comprising a housing having a fuel inlet port and a fuel outlet port, a porous piezoelectric ceramic filtering element having working surfaces thereon and located in the housing in the flow path of the fuel, partitioning the housing into an input part and an output part, a metallic coating on said working surfaces, and a generator of electric oscillations connected to said metallic coating

whereby foreign matter in the fuel is removed by the filter and vibration of the filter effected by the generator of electric



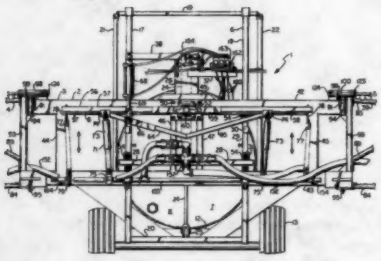
oscillations prevents clogging of the filter and emulsifies the fuel.

4,372,492

SPRAYER BOOM STRUCTURE

Richard A. Blumenshine, Blue Springs, Mo., assignor to Lely Independence Mfg., Inc., Independence, Mo.

Filed Feb. 19, 1981, Ser. No. 235,983
Int. Cl.³ A01C *3/04*
U.S. Cl. 239—168 **9 Claims**



1. A spray boom assembly comprising:
(a) an inner frame adapted for mounting to a transport vehicle;
(b) an elongate spray boom having a center portion and opposite ends, said center portion being mounted to said frame in facing relationship;
(c) a pivot means connected to and extending through said inner frame and said center portion and permitting up and down swinging movement of said spray boom about said pivot means in response to movement of said vehicle;
(d) a biasing frame facing said inner frame and said center portion and affixed to said pivot means for rotation thereabout;
(e) means extending between said inner frame and said biasing frame and positioning said biasing frame at a rotational attitude relative thereto; and
(f) shock absorber means connected to and extending between said spray boom center portion and said biasing frame for absorbing rotational transients and limiting rotation of said spray boom about said pivot means.

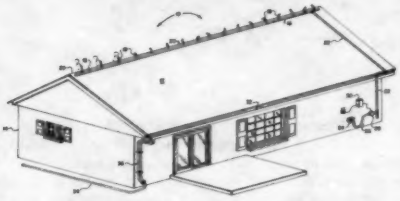
4,372,493

ROOF COOLING SYSTEM

Jimmie L. Smith, 1812 Boulder, Plano, Tex. 75023

Continuation-in-part of Ser. No. 124,813, Feb. 26, 1980, abandoned. This application Dec. 24, 1980, Ser. No. 219,932
Int. Cl.³ B05B *15/00*
U.S. Cl. 239—208 **16 Claims**

1. Water sprinkler apparatus for distributing water over the surface of a roof comprising:
elongated water supply conduit means adapted to be supported on a roof,
a plurality of flexible tubes each having a first end nonrotatably attached to an upper surface of said conduit means at spaced apart intervals along said conduit means and in fluid communication with said conduit means, said tubes being of a flexible material and of a length such that when water is not being forcibly discharged through said tubes said tubes hang with a second end pointing generally downward, and the pressure of water discharged from



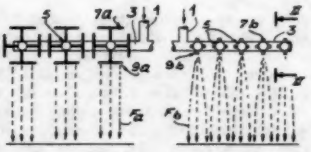
said tubes is sufficient to raise the second end of said tubes to a point wherein water is discharged from said tubes in a generally horizontal direction over said roof; and
a directional nozzle attached to said second end of each of said tubes for receiving fluid from said tube, said nozzle having an outlet angularly displaced from the longitudinal axis of said second end of said tube in such a way as to provide random movement of said second end without forced rotation of said tube about its own longitudinal axis when water is being discharged from said tube through said nozzle.

4,372,494

SPRAY NOZZLE

Christian Naturel, Pacy, and Etienne Minot, Saint Andre, both of France, assignors to Carbonisation Entreprise et Ceramique (C.E.C.), Montrouge, France

Filed Feb. 19, 1981, Ser. No. 235,939
Claims priority, application France, Feb. 28, 1980, 80 04438
Int. Cl.³ B05B *1/14*
U.S. Cl. 239—553.3 **11 Claims**



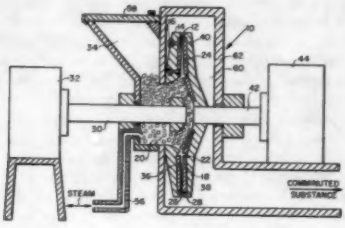
1. A spray nozzle for the spraying of liquid, comprising:
a nozzle body provided with a cylindrical chamber of given diameter permitting passage of a liquid into a nozzle and at a nozzle liquid outlet a plurality of equidistantly spaced, identical holes, whose axes are inclined relative to a nozzle axis;
a calibrated alumina member positioned at the intake of the liquid into the nozzle defining a passage for the liquid outflow, having a diameter less than the diameter of the chamber, said member having a concave face at the inlet and a constriction of said passage to limit liquid flow entering the nozzle, the liquid flowing directly from the constriction to said holes through at least a portion of the cylindrical chamber; and
fixing means securing said member to the nozzle body.

4,372,495

PROCESS AND APPARATUS FOR COMMINUTING USING ABRASIVE DISCS IN A DISC REFINER

Renata Marton, Syracuse, and Alton F. Brown, Cazenovia, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,019
Int. Cl.³ B02C 7/12
U.S. Cl. 241—28 28 Claims



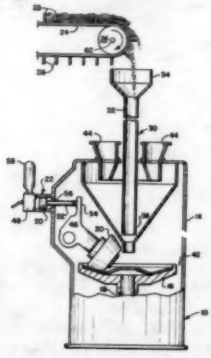
1. A mechanical comminuting plate for use as a part of a mechanical comminuting disc, said plate comprising a truncated circular sector having a disintegrating surface, said surface being divided by an arc of the circle of the sector into adjacent inside and outside surfaces, the inside surface of which is provided with a series of integral breaker bars each of which has a longitudinal axis essentially parallel with the nearest diameter of the circle of the sector and said outside surface comprising an abrasive having an average particle size of between about 140 micrometers and ¼ centimeter.

4,372,496

ELECTRONIC CONTROLLER OF HYDRAULIC PRESSURE FOR JOURNAL LOADING OF BOWL MILL

Theodore V. Maliszewski, North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 1, 1980, Ser. No. 192,774
Int. Cl.³ B02C 4/32
U.S. Cl. 241—37 10 Claims



1. In the combination of a bowl mill operative for pulverizing coal therewithin and a belt feeder means operative for feeding coal to the bowl mill, said bowl mill including a separator body, a grinding table supported on a shaft for rotation within the separator body, at least one grinding roll supported within the separator body so as to be operable to exert a grinding force on the coal disposed on the grinding table for purposes of effecting the pulverization thereof, and a hydraulic fluid means cooperatively associated with the grinding roll and operative for purposes of establishing the hydraulic journal loading on the grinding roll that enables the grinding roll to apply grinding force to the coal on the grinding table, the improvement comprising an electronic controller for effecting control over the hydraulic journal loading applied to the grinding roll in accordance with the rate at which coal is fed to the bowl mill by the belt feeder means, said electronic controller comprising:

(a) first means cooperatively associated with the belt means and operative for deriving an electronic signal therefrom corresponding to the rate at which coal is being fed to the bowl mill by the belt feeder means;

(b) second means cooperatively associated with the hydraulic fluid means and operative for deriving a signal corresponding to the hydraulic pressure present in the hydraulic fluid means;

(c) a controller station having a pre-established bank of data stored therein corresponding to the optimum amount of grinding force that the grinding roll should exert for different rates of feed by the belt feeder means of coal to the bowl mill, said controller station being connected in circuit relation with said first means for receiving in the form of a first input the electrical signal derived by said first means, said controller station further being connected in circuit relation with said second means for receiving in the form of a second input the signal derived by said second means, said controller station being operative to compare the information received by said controller station in the form of the first and second inputs with the pre-established bank of data stored in said controller station, said controller station being operative based on this comparison to selectively produce an increase pressure output signal or a decrease pressure output signal or no output signal as required in order to cause the grinding roll to exert the optimum amount of grinding force for the particular rate of feed at which the belt feeder means is sensed to be feeding the coal to the bowl mill;

(d) hydraulic fluid supply means connected in fluid flow relation with the hydraulic fluid means, said hydraulic fluid supply means further being connected in circuit relation with said controller station;

(e) third means interconnecting said controller station with said hydraulic fluid supply means and operative for transmitting the increase pressure output signal produced by said controller station to said hydraulic fluid supply means to cause said hydraulic fluid supply means to supply hydraulic fluid therefrom to the hydraulic fluid means to cause the hydraulic pressure in the hydraulic fluid means to increase for purposes of effecting a concomitant increase in the grinding force exerted by the grinding roll such that the grinding force being exerted by the grinding roll represents the optimum grinding force for that particular rate of feed at which the belt feeder means is sensed to be feeding the coal to the bowl mill; and

(f) fourth means interconnecting said controller station with said hydraulic fluid supply means and operative for transmitting the decrease pressure output signal produced by said controller station to said hydraulic fluid supply means to cause said hydraulic fluid supply means to receive hydraulic fluid from the hydraulic fluid means to cause the hydraulic pressure in the hydraulic fluid means to decrease for purposes of effecting a concomitant decrease in the grinding force exerted by the grinding roll such that the grinding force being exerted by the grinding roll represents the optimum grinding force for that particular rate of feed at which the belt feeder means is sensed to be feeding the coal to the bowl mill.

4,372,497

METHOD OF MANUFACTURING WOUND ITEMS FROM COAXIAL MICROWIRE AND DEVICE THEREFOR

Sergei N. Dimitraki, and Lolita S. Dimitraki, both of ulitsa Bubnovskogo, 5/5, kv. 118, Kishinev, U.S.S.R.

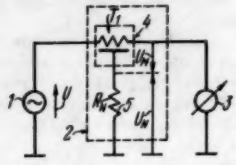
PCT No. PCT/SU80/00001, § 371 Date Sep. 8, 1980, § 102(e) Date Sep. 3, 1980, PCT Pub. No. WO80/01431, PCT Pub. Date Jul. 10, 1980

PCT Filed Jan. 8, 1980, Ser. No. 205,445

Claims priority, application U.S.S.R., Jan. 8, 1979, 2700551; Jan. 8, 1979, 2700552

Int. Cl.³ H01F *41/04;* H01C *17/22*

U.S. Cl. 242—7.03 4 Claims



1. A method of manufacturing wound items from coaxial microwire comprising the steps of unwinding microwire from an item being manufactured with continuous measurements of an electrical parameter of the unwound wire; stopping the microwire unwinding process as the electrical parameter of the unwound wire reaches a predetermined value; inserting said item being manufactured in an electrical circuit including a voltage source determining a voltage frequency f_1 at which a phase shift between a current vector in a coaxial sheath of a microwire of the item being manufactured whose electrical parameter exceeds the rating and voltage vector between the coaxial sheath and conductor of the microwire equals 180°; setting voltage frequency f_2 at which a phase shift between the current vector in the coaxial sheath of the microwire of the item being manufactured whose electrical parameter fully complies with the corresponding rating and the voltage vector between the coaxial sheath and conductor of the microwire is 180°; converting voltages at the frequencies f_1 and f_2 into voltage at the frequency f_X, where

$$f_X = \frac{f_2 \cdot f_1}{f_2 - f_1};$$

applying the voltage at the frequency f_X to the coaxial sheath of the microwire of the item being manufactured; and again unwinding the microwire with the current vector phase in the coaxial sheath of the unwound wire being continuously compared with the voltage vector phase between the conductor of said microwire and its coaxial sheath, the unwinding of the microwire from the item being manufactured being continued until the electrical parameter of the item being manufactured reaches the preset rating, a condition corresponding to a 180° difference between the compared phases in the unwound wire.

3. A device for manufacturing wound items from coaxial microwire comprising a take up mechanism taking up wire unwound from an item being manufactured and having electrical contacts; a securing mechanism securing the item being manufactured and having a sliding contact; an electrode providing coupling between the microwire and an electrical circuit and disposed between the microwire take up mechanism and the securing mechanism; a microwire rewind drive kinematically coupled to the microwire take up mechanism and to the securing mechanism; a control unit controlling the microwire rewind drive and having an output connected to the microwire rewind drive; an amplifier and converter unit transmitting a converted signal conveying information on parameters of the item being manufactured to the microwire rewind drive control unit; a first harmonic generator; a second harmonic generator; a switch with first, second, third and fourth contact sets; a frequency changer having a first input connected to a potential output of the second harmonic generator and a second input coupled to a potential output of the first harmonic generator through a second fixed contact and a moving contact of the first contact set of the switch; wherein the moving contact of the first contact set of the switch is connected to a first fixed contact of the second contact set of the switch, a moving contact of the second contact set of the switch is connected to an electrical contact of said takeup mechanism having galvanic coupling with one of the ends of the conductor of the microwire of the item being manufactured, an output of the frequency changer is connected to a second fixed contact of the third contact set of the switch, a moving contact of the third contact set is connected to the sliding contact of the securing mechanism; further comprising an indicator having a potential input connected to a first fixed contact of the third contact set of the switch; a resistance box having a first pole connected to a moving contact of the fourth contact set of the switch being connected to a flexible current lead of the item being manufactured; a current-to-voltage converter having a potential input connected to an electrical contact of the microwire takeup mechanism; an amplifier and converter unit having inputs connected to an output of said current-to-voltage converter, and a second input connected to a second fixed contact of the second contact set of the switch; wherein a second input of the indicator, a second output of the second harmonic generator, a second pole of the resistance box, a case of the frequency changer, a second input of the current-to-voltage converter, a second output of the first generator, and an electrode are connected to a neutral wire of the device.

4,372,498

DEVICE FOR FORMING STORE UNITS FROM A THREAD SUPPLIED FROM A YARN PACKET

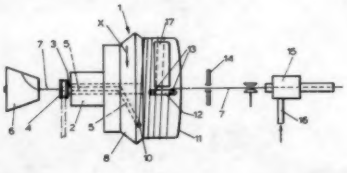
Hubert P. Van Mullekom, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Oct. 22, 1980, Ser. No. 199,579

Claims priority, application Netherlands, Nov. 27, 1979, 7908595

Int. Cl.³ B65H *51/20*

U.S. Cl. 242—47.01 3 Claims



1. A device for forming store units from a thread supply, comprising, in combination, a stationary winding means defining a circumferential winding surface, a longitudinal slot in said surface, a thread guide rotatably mounted adjacent to one end of said surface for winding the thread on said surface, a plurality of pins which are movable in succession in an endless path in the radial plane of said slot, first radially outward to protrude through the portion of said slot adjacent to said one end of said surface, then forward along said slot, and then radially inward to retract into said slot, thereby separating the thread windings on said surface into successive store units, each store unit comprising a plurality of thread windings, and thread transporting means for drawing each store unit forward off said surface as it is released by retraction of a pin, wherein the improvement comprises brake means which is movable into braking contact with the trailing portion of each store unit

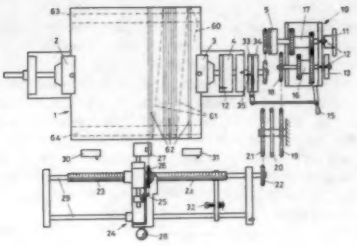
of thread as withdrawal of such store unit from said surface is completed.

4,372,499

PROCESS AND APPARATUS FOR PREPARING FABRIC PATTERNS

Peter Bächinger, Bergli, 9630 Wattwil, Switzerland

Filed Apr. 21, 1980, Ser. No. 141,901
Claims priority, application Switzerland, Oct. 15, 1979, 9262/79
Int. Cl.³ B65H 54/68
U.S. Cl. 242—50 11 Claims



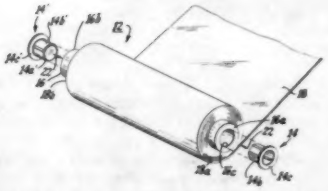
1. In a process of preparing a fabric pattern by winding a plurality of yarns of various colors in a pattern about a rectangular card having front and rear sides, said pattern having at least one repetitive color with at least one different color interposed between repetitions, the improvement comprising the consecutive steps of winding a first yarn of a first selected color about said card at all points corresponding to said first color in said fabric pattern before a yarn of another color is wound about said card, and winding a second yarn of a second selected color about said card at all points corresponding to said second color in said fabric pattern.

4,372,500

INSERTS FOR USE WITH WEB DISPENSING MEANS

Alfred Saraisky, 27 Cayuga Ave., Oakland, N.J. 07436

Filed Feb. 18, 1981, Ser. No. 235,669
Int. Cl.³ B65H 79/02
U.S. Cl. 242—55 18 Claims



1. An insert arranged to be held by the hand of an operator for use in dispensing a web from a supply roll, said web being a web of wrapping film wrapped about a core comprising a hollow cylinder, said insert comprising:

a substantially cylindrical side wall having a first and second end and tapering slightly from said second end towards said first end so that said second end is wider than said first end, the hollow interior of said side wall being of a depth sufficient to receive the fingers of the operator when in use;

an end surface integral with said first end for substantially closing said side wall at said first end;

a substantially flat annular shaped flange having its inner periphery integrally joined to the second end of said side wall, which second end is open;

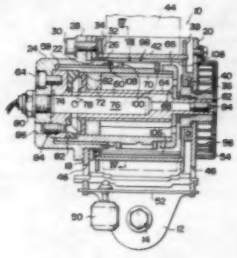
said insert being inserted into at least one end of said cylinder with said flange overlying at least the adjacent end of said cylinder, said insert being formed of a plastic material having a low coefficient of sliding friction, the surface of said insert engaging said cylinder being smooth, whereby said insert is freely slidable relative to said cylinder; the thickness of the insert being selected to significantly reduce the weight of the insert and enable the insert to be quite yieldable to facilitate insertion into the cylinder.

4,372,501

SEATBELT RETRACTOR

Mitsuo Inukai, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 13, 1981, Ser. No. 224,699
Claims priority, application Japan, Jan. 16, 1980, 55-3153[U]
Int. Cl.³ A62B 35/02; B05H 75/48
U.S. Cl. 242—107 8 Claims



1. A seatbelt retractor for use in a seatbelt system for protecting an occupant in an emergency of a vehicle, comprising:

(a) a frame secured to a vehicle body;

(b) a takeup shaft pivotally supported on said frame for winding up an occupant restraining webbing, said takeup shaft being provided on the inner periphery thereof with a ratchet wheel;

(c) a drum pivotally supported on said frame and rotatable by expansion of a pressure chamber provided therein;

(d) a clutch mechanism for imparting a turning force of said drum, when said drum rotates, to said takeup shaft as a webbing windup turning force;

(e) a powder unit provided in communication with said pressure chamber of the drum for imparting an explosive pressure to said pressure chamber to rotate said drum in an emergency of the vehicle, said powder unit secured to and in a position facing said powder chamber;

(f) a control valve provided in communication with said pressure chamber of the drum for releasing a high pressure to atmosphere when the pressure in the pressure chamber exceeds a predetermined value, whereby the pressure in the pressure chamber is maintained to less than the predetermined value to restrict a webbing takeup force of said takeup shaft to be applied to the occupant;

(g) a drum support shaft solidly secured to the frame;

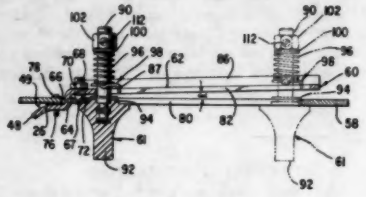
(h) a powder chamber provided in said drum support shaft, a through-hole extending through a core portion of the drum support shaft constituting said powder chamber, said powder chamber communicating with said pressure chamber.

4,372,502

ADJUSTABLE THREAD TENSIONING DEVICE FOR A SEWING MACHINE

Robert H. Larsen, Middletown, N.J., and Anthony Giaimo, Staten Island, N.Y., assignors to The Singer Company, Stamford, Conn.

Filed Mar. 23, 1981, Ser. No. 246,531
Int. Cl.[3] D05B *47/02;* B65H *59/22*
U.S. Cl. 242—149 6 Claims



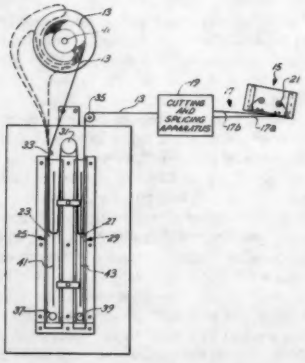
1. A thread tensioning device comprising a base plate with an opening therethrough; a rigid beam including a portion on one side of the plate defining a thread receiving gap with the plate, another portion on the other side of the plate, and a connecting portion extending through the plate opening; a fulcrum mounting the beam between the ends thereof for pivotal movement about an axis which is substantially fixed longitudinally along the base plate and beam; and a tension selector mounted for sliding motion on the base plate, the selector including a member movable along said another portion of the beam as the selector moves on the base plate, an adjustable spring for forcibly urging said member against the beam to cause frictional force to be applied to thread in said gap in accordance with the position of the selector and adjustment of the spring, and means for adjusting the spring to preset tension in the thread at a defined position of the selector along the base plate.

4,372,503

FLEXIBLE TAPE CONTROL APPARATUS

David W. Kincheloe, West Chicago, and David O. Neathery, St. Charles, both of Ill., assignors to King Instrument Corporation, Westboro, Mass.

Filed Oct. 23, 1980, Ser. No. 199,924
Int. Cl.[3] G11B *15/06*
U.S. Cl. 242—183 14 Claims



10. A tape cassette loader in which two different controlled tensions are provided to a magnetic tape moving from a supply spool to a cassette spool of a tape cassette at a greatly varying speed, said loader comprising:

a supply spool for providing a supply of magnetic tape;

a cassette spool for receiving the magnetic tape;

first tension means for receiving the magnetic tape from said supply spool and providing a first tension to said tape, said first tension means containing a length of the tape in order to maintain said first tension;

first sensor means for monitoring the length of tape contained by said first tension means;

second tension means for receiving the tape from said first tension means prior to take up by said cassette spool and providing a second tension to the tape, said second tension means containing a length of the tape in order to maintain said second tension;

second sensor means for monitoring the length of the tape contained by said second tension means;

tape moving means interposing said first and said second tension means for moving the tape from said first tension means to said second tension means; and

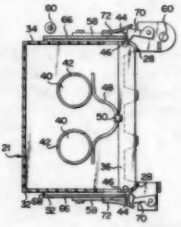
control means for driving said tape moving means, said supply spool and said cassette spool, said control means being responsive to said first and said second sensor means for controlling the speed at which the tape is moved by said tape moving means and controlling the speed of said supply spool, whereby said first and said second tensions are maintained during movement of the tape from said supply spool to said cassette spool.

4,372,504

MAGNETIC RECORD TAPE PROTECTIVE DEVICE FOR A TAPE CASSETTE

Tsutomu Shibata, Hachioji; Kenji Kimura, Tachikawa; Ken Satoh, Akigawa; Sinichi Saitou, Hachioji; Toshikazu Kato, Hino; Seizo Watanabe, and Ken Ohshima, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1980, Ser. No. 199,223
Claims priority, application Japan, Oct. 26, 1979, 54-148561[U]; Oct. 26, 1979, 54-148562[U]
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—198 18 Claims



1. A magnetic recording tape protective device for a tape cassette removably loaded into a tape cassette loading section of a magnetic tape transport device, the tape cassette having a housing, at least one reel hub in said housing, and a magnetic recording tape in said housing and wound around said at least one reel hub, said housing including a pair of speced apart holding plates for rotatively holding said reel hub, a peripheral wall formed continuously to said holding plates for connecting said holding plates, and at least one window allowing a pinch roller and a magnetic head to be inserted therethrough, said at least one window extending from said peripheral wall to at least one of said holding plates, the portion of said window in said at least one holding plate being a holding-plate forming portion of said at least one window, said protective device comprising:

a shutter member mounted in said housing and being movable between a first position to close said holding-plate forming portion of said at least one window and a second

position to release the closed state of said holding-plate forming portion of said at least one window, thereby opening said at least one window;

urging means coupled to said shutter member for urging said shutter member to said first position; and

drive means at least partially provided on said shutter member for moving said shutter member from said first position to said second position in cooperation with said tape cassette loading section when the tape cassette is loaded into said tape cassette loading section, said drive means including an elongated hole formed in a surface of a housing disposed in opposition to said tape cassette loading section, said elongated hole being elongate in a direction of the movement of said tape cassette housing relative to said tape cassette loading section when the tape cassette is loaded into said tape cassette loading section; a projection fixed to said shutter member and slideably mounted in said elongated hole so as to be movable along said elongated holein said direction of movement of the tape cassette relative to the loading section; and means in said tape cassette loading section for engaging said projection of said shutter member and for sliding said projection in said elongated hole to move said shutter member to said second position when the tape cassette is loaded into said tape cassette loading section.

4,372,505

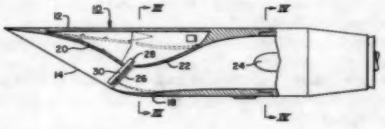
SUPERSONIC INLET HAVING VARIABLE AREA SIDEPLATE OPENINGS

Jan Syberg, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 17, 1979, Ser. No. 104,477

Int. Cl.³ B64B 1/24

U.S. Cl. 244—53 B **6 Claims**



1. An inlet duct for supersonic aircraft comprising an inlet channel having top and bottom walls and side walls, the top wall extending beyond the forward lip of the bottom wall and the lower edges of the side walls extending from the forward lip of the top wall to the forward lip of the bottom wall, the walls of the duct being arranged to produce a normal shock wave in close proximity to said forward lip of the bottom wall, variable area slot means located through said side walls upstream of said bottom wall forward lip and, during substantially all engine operations, upstream of said normal shock wave, and means for varying the area of said slot means to provide boundary layer control for controlling the normal shock-boundary layer interaction.

4,372,506

LANDING GEAR FOR ULTRALIGHT AIRCRAFT

David Cronk, 1069 Eucalyptus Ave., Vista, Calif. 92025, and Lyle M. Byrum, 1471 Calle Redonda, Escondido, Calif. 92026

Filed Jun. 5, 1980, Ser. No. 156,768

Int. Cl.³ B64C 25/04

U.S. Cl. 244—100 R **10 Claims**

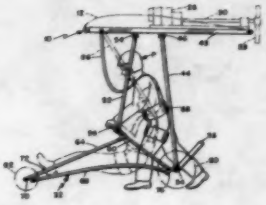
1. A landing gear assembly for light winged aircraft, said gear comprising:

an elongated main axle having a wheel on each end and arch intermediate the ends;

a pair of elongated main struts, each connected at an upper end to the airframe of an aircraft and at the lower end to said axle adjacent an end thereof, said struts forming with said axle a generally triangular configuration;

a hand control cross bar disposed above and forward of said axle;

a pair of upper downwardly depending struts, each connected at an upper end to the airframe and at the lower end to an outer end of said cross bar, and



a pair of forward link members, each connected at a lower end to the main axle at one end thereof and extending upwardly and forwardly and connected to an end of said cross bar.

4,372,507

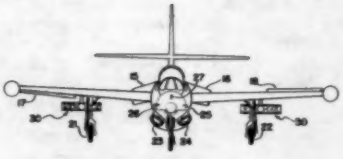
SELECTIVELY ACTUATED FLIGHT SIMULATION SYSTEM FOR TRAINER AIRCRAFT

James L. Denniston, Columbus, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 2, 1977, Ser. No. 773,632

Int. Cl.³ B64C 9/32

U.S. Cl. 244—113 **8 Claims**



5. In a trainer aircraft, in combination:

(a) speed brake means, said speed brake means being movable from a faired position to a uniform stationary initial open position, and from said initial open position to a full open position;

(b) actuator means connected in moving relation to said speed brake means;

(c) angle of attack sensor means; and

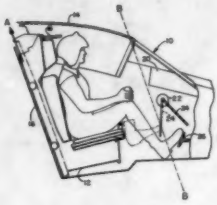
(d) control means connected to said actuator means responsive to said angle of attack sensor means for modulating through said actuator means the position of said speed brake means from said faired position to said initial open position as a step function and in the range of said initial open position to said full open position as a function of the angle of attack of said trainer aircraft, said speed brake means being rotated approximately 10° from said faired position to said initial open position, and approximately an additional 40° from said initial open position to said full open position, said speed brake means being modulated over said range of said initial open position to said full open position through a range of approximately 5° sensed by said angle of attack sensor means.

4,372,508

DYNAMIC KICKPLATE DEPLOYMENT SYSTEM

Georg D. Frisch, Holland, and William Ward, Jr., Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 244,420
Int. Cl.³ B64D *11/06*
U.S. Cl. 244—122 AG **4 Claims**



1. Apparatus for positioning the feet of a subject from the rudder pedals of an aircraft into the ejection clearance envelope of the aircraft during ejection, said envelope including all the area required for the safe ejection of the subject, comprising:

actuator means triggered by the pilot for providing an ejection command signal; and

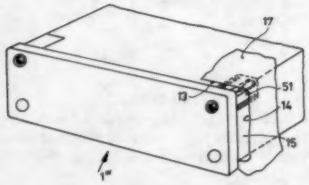
plate means responsive to said signal pivotally mounted to the aircraft's structure on an axis forward of the envelope and parallel to the lateral axis of the aircraft for urging the feet rearwardly into the envelope.

4,372,509

DEVICE FOR FIXING AN APPARATUS IN A CUT-OUT OF A PANEL

Günter Krainhöfer, Solms, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1980, Ser. No. 205,210
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944862
Int. Cl.³ G12B *9/00*
U.S. Cl. 248—27.1 **1 Claim**



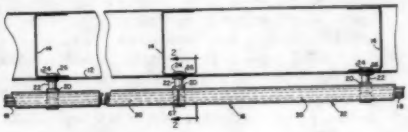
1. A system for clamping an apparatus in a rectangular cut-out of a panel, said apparatus being arranged on the rear side of the panel and a cover plate being provided on the front side of the panel, said system being adapted for use in a corner area of said cut-out, which comprises a truncated rectangular pyramid displaceable in a direction perpendicular to the plane of the panel; a frame associated with the apparatus and provided with two fixing parts, one fixing part being formed as a first clamping wedge pivotal about a first axis parallel to one edge of the cut-out and the other fixing part being formed as a second clamping wedge pivotal about a second axis perpendicular to said one edge, adjacent walls of said truncated pyramid being respectively engageable with a wall of said first clamping wedge and a wall of said second clamping wedge; and a screw extending through an opening in said cover plate into a threaded recess in said truncated pyramid, whereby adjustment of the truncated pyramid relative to the two clamping wedges may be effected from the front side of the apparatus and whereby, upon turning of the screw to draw the truncated pyramid toward the panel, said truncated pyramid engages the respective clamping wedges and forces the same outwardly in mutually perpendicular directions against the respective adjoining edges of said corner area of the cut-out.

4,372,510

WIRE RACEWAY FOR ATTACHMENT UNDER THE FLOOR OF A RAILWAY CAR

Louis M. Skypala, Oreland, Pa., assignor to The Budd Company, Troy, Mich.

Filed Aug. 4, 1980, Ser. No. 175,333
Int. Cl.³ E21F *17/02*
U.S. Cl. 248—58 **8 Claims**



1. A wire raceway for holding wires extending under the floor of a railway car comprising:

(a) a plurality of threaded studs secured to said floor and extending downward therefrom, a spacer member positioned about said threaded stud adjacent said floor and a spaced hanger member positioned on each of said studs below said spacer and comprising a flat center connecting section about said stud, opposite laterally extending sections extending from said center connecting section for supporting wires to be placed thereon in the space between said hanger member and floor, and a nut threadably engaging the threads of said stud and engaging said center section for securing said center section against said spacer member,

(b) a cover below said nut and including a plurality of extending sections extending between said spaced hanger members, and

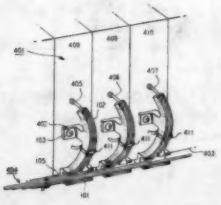
(c) strap elements disposed to be connected to said threaded stud at the ends of said sections of said cover to support said sections against said hanger members.

4,372,511

OPTICAL FIBER CABLE STRAIN RELIEF ASSEMBLY

Susan F. Knowles, North Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1980, Ser. No. 213,936
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—68 R **3 Claims**



1. An assembly for planar surface mounting which supports and guides a plurality of optical fiber cables (**404**), said assembly being CHARACTERIZED BY

a straight cable duct (**101**) having uninterrupted bottom and

sidewall surfaces sized to completely receive said cables, said straight duct being open at the top to allow accessability to said cables when said assembly is mounted;

a curved cable duct (102) which extends from an intermediate position on said straight cable duct to completely receive and guide a selected one of said cables through two coincident gradual curves (106,107) in two orthogonal planes, said curved cable duct being open at the top to allow accessibility to said selected cable when said assembly is mounted;

a support leg (103) extending from said curved cable duct to an end which is in alignment with a portion of the underside of said straight duct; and

a protrusion (105) extending from said straight duct beyond said end to restrict rotation of said strain relief assembly by extending over the edge of the planar mounting surface.

4,372,512

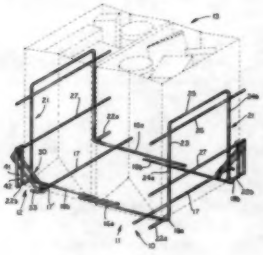
BAG SUPPORTING APPARATUS

W. Roger Wolfe, 3801 Northlake Creek Dr., Tucker, Ga. 30084

Filed May 14, 1981, Ser. No. 263,359

Int. Cl.³ A63B *55/04*

U.S. Cl. 248—97 **3 Claims**



1. Support apparatus for stabilizing in an upright position at least one unstable object such as a grocery bag or the like, said apparatus comprising:

base means receivable beneath an object to be stabilized, said base means including a plural number of tines maintained in mutually spaced apart relationship in a common plane, to fit between the object being stabilized and a support surface;

upright support means pivotably connected to said base means, and selectably movable to occupy either an upright or a folded position relative to said base means;

latch means operatively associated with said object support means to maintain said object support means in the upright position relative to said base means, so as to contact and support an object received on said base means;

said latch means being selectably operative to allow the object support means to pivot to the folded position disposed alongside and substantially parallel to said tines of the base means;

said upright support means comprising a U-shaped member including a pair of spaced apart elongated support members individually pivotably connected to corresponding tines, and a bridging member extending between said elongated support members at a location spaced apart from said pivotable connection and rigidly interconnecting the elongated support members;

said latch means including a latch member connected to one of said elongated support members spaced apart from said pivotable connection, and a latch engaging member movably connected to the corresponding tine of said base means spaced apart from said pivotable connection;

said latch engaging member including a first channel extending from said movable connection and within which said latch member is slidably disposed, and a second channel joining said first channel at a substantial angle to selectably slidably receive said latch member;

said second channel being located above said first channel in position for alignment with said latch member when said elongated support members are moved to said upright position, so that the latch member enters said second channel and the latch engaging member automatically moves downwardly to latch the upright position when said latch member is moved along said first channel into alignment with said second channel; said latch engaging member being selectably operative to disengage the latching member when the latch engaging member is moved upwardly to return said latch member to said first channel; and

guide means engaging said latch member to move said latch engaging member to position substantially in plane alignment with said tines and said upright support means when moved to said folded position, so that the entire apparatus is folded substantially flat for storage.

4,372,513

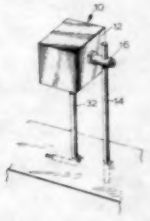
SUPPORT COUPLING FOR OUTDOOR ELECTRICAL JUNCTION BOX

Thomas P. Calnan, 4200 NE. 3rd Ave., Pompano Beach, Fla. 33064

Filed Aug. 11, 1980, Ser. No. 177,223

Int. Cl.³ A47G *23/02*

U.S. Cl. 248—146 **3 Claims**



1. In combination with an existing outdoor electrical junction box supported above the ground and having at least one knockout opening and an easily connectable support shaft driven into the ground adjacent said outdoor electrical junction box, and a coupling member comprising:

a body, said body having a threaded end means for securing said body to said knockout opening of said junction box;

a central passageway means disposed transversly through said body, said passageway means sized for sliding engagement with said support shaft to support said outdoor electrical junction box above the ground;

retaining means for maintaining said coupling member in a predetermined non-slidable position along said support shaft;

said threaded end means sized for threadably mating with said opening in said outdoor electrical junction box for securing said coupling member to said outdoor electrical junction box;

nut means for locking said outdoor electrical juaction box and said coupling member in a particular position by external movement of said nut means, said nut means screwed onto said threaded end means before said threaded end is mated with said outdoor electrical junction box.

4,372,514

MOBILE STORAGE PLATFORM

Nick P. Glumac, 355 Litchfield Rd., Kingsford Heights, Ind. 46346

Filed Sep. 15, 1980, Ser. No. 187,349
Int. Cl.³ F16M 11/32
U.S. Cl. 248—163 R 2 Claims

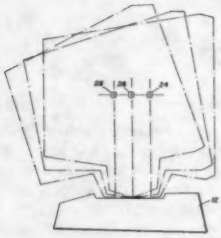
1. In a mobile storage platform having at least two peripheral longitudinal members and a plurality of lateral members connected thereto comprising a horizontal frame, and having supporting legs connected to and depending from said frame, the improvement wherein the supporting legs are arranged in pairs, at least two pairs along each longitudinal side, the legs of each pair converging from their connector with the frame, a foot piece joined to the converging free ends of each pair, stop means attached to said converging ends and spacer means intermediate the upper ends of said legs and said frame, whereby a plurality of essentially identical mobile storage platforms may be stacked one upon the other with the converging pairs of legs of a next upper platform being received within the pairs of a next lower platform, said pairs nesting within each other and said stop means limiting nesting to prevent jamming in a longitudinal direction while said spacer means prevents jamming of said legs in a lateral direction.

4,372,515

CRT HOUSING SUPPORT AND ROCKING TILT APPARATUS

D. Thomas Noonan, Irving, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 184,873
Int. Cl.³ F16M 11/04
U.S. Cl. 248—178 4 Claims



1. Apparatus for supporting a display housing while providing rocking tilt adjustment, said apparatus comprising:

a housing support member operatively connected to said housing;

a base member;

means for mounting said base member to said housing support member to allow a rolling tilt movement therebetween, said means for mounting including an involute gear form and rocker means;

vertical retention means for preventing separation of said base member and said housing support member when upward force is applied to said housing support member, said vertical retention means including a U-shaped bracket attached to said housing support member and positioned such that the open portion of the U-shaped bracket is directed away from the housing support member, each end portion of the U-shaped bracket being formed to provide an arcuate shaped aperture therein, two L-shaped brackets attached to the base member with one end portion of each L-shaped bracket being formed to provide an aperture therein, said L-shaped brackets being positioned with the end portion containing the aperture in operative relationship with the aperture formed in a corresponding end portion of the U-shaped bracket, fastener means operatively positioned through said apertures;

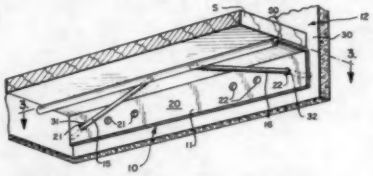
said vertical retention means including a spring-loaded friction mechanism operatively associated with said vertical retention means to assure that said housing support member retains its position with respect to said base after a rocking tilt adjustment has been completed.

4,372,516

SHELF MOUNTING BRACKET AND ASSEMBLY

Lawrence M. Nyquist, 3018 N. Spaulding, Chicago, Ill. 60618

Filed Feb. 3, 1981, Ser. No. 231,510
Int. Cl.³ A47G 29/02
U.S. Cl. 248—235 3 Claims



1. A bracket and wall combination comprising:

(a) a sheet of drywall;

(b) a bracket member having a side leg;

(c) said side leg being seated flush against the outer surface of said drywall;

(d) said bracket member also having a top leg;

(e) said top leg extending substantially the length of said side leg and protruding outwardly of said side leg to a free edge;

(f) lip means formed on said outer free edge of said top leg, substantially along its length, and inwardly toward said side leg;

(g) an aperture in said side leg and a hole formed through said drywall sheet in alignment with said aperture;

(h) pin means having an inner section, a middle section and an outer section having a free end;

(i) said pin means extending through said aperture and said hole and adapted to grip the sheet with its inner section when its outer section is pivoted about said middle section towards said side leg;

(j) said free end of said outer section being resiliently retained under said lip means with said inner section gripping said wall to hold said bracket tightly against said sheet.

4,372,517

SLOT-TYPE ACCESSORY MOUNTING

Joseph J. Welch, Huntington Beach; William C. Grove, Tujunga, and Michael E. Moran, Newhall, all of Calif., assignors to Lockheed Corporation, Burbank, Calif.

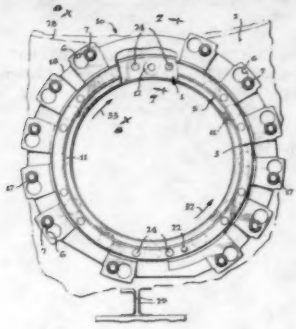
Filed Jul. 2, 1980, Ser. No. 165,260
Int. Cl.³ F16M 11/00
U.S. Cl. 248—267 19 Claims

1. A quick attach-detach mechanism for mounting a first member to a second member comprising:

a collar means rotatably coupled to said first member, said collar being slotted to provide a pattern of circumferentially spaced slots;

a plurality of fastener means secured to said second member,

said fasteners being circumferentially spaced and adapted to pass through a first portion of said slots upon relative axial movement between said collar means and said second member, said fasteners and said slots being further



adapted to mount said first member to said second member upon rotation of said collar, each said fastener means comprising a shaft element and an enlarged element adapted for movement along said shaft.

4,372,518

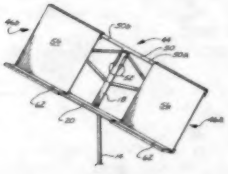
MUSIC STAND EXTENDER

Americole R. Biasini, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

Continuation-in-part of Ser. No. 916,204, Jun. 16, 1978, Pat. No. 4,312,490. This application Dec. 10, 1979, Ser. No. 101,878

Int. Cl.³ A47B *19/00*

U.S. Cl. 248—441 R **25 Claims**



1. An extension apparatus to enlarge the support area of a stand, such as a music stand, said stand having a main central support member and a lower support member extending laterally from the central support member, said apparatus comprising:

a. an upper support section adapted to be mounted to said stand at an upper end thereof, said support section comprising two laterally and oppositely extending support arms,

b. a pair of extension wings adapted to be mounted to said stand and to said upper support section, each wing comprising:

1. a panel portion,

2. a lower support flange means adapted to be positioned against the lower support member of the stand,

3. a lower retaining portion adapted to engage said lower support member to permit lateral slide motion between the wing and the lower support member,

4. an upper retaining portion adapted to engage a related support arm to permit lateral slide motion between the wing and the related support arm,

whereby with said upper support section mounted to said stand, and with each of the extension wings mounted to the stand and to the upper support section, the two wings can be moved horizontally inward to a middle position, or horizontally outwardly to an expanded position to provide an expanded support area for the stand.

4,372,519

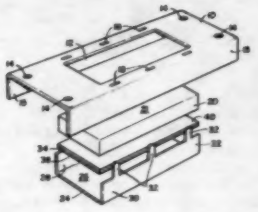
APPARATUS FOR MOUNTING A MIRROR

Francis E. Huntoon, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 29, 1980, Ser. No. 201,896

Int. Cl.³ A47G *29/00*

U.S. Cl. 248—466 **5 Claims**



1. An apparatus for mounting a mirror (20) comprising:

a mounting plate (10) with a mirror opening (12) defined in said mounting plate (10), said mounting plate (10) having a substantially flat first surface over that portion of the mounting plate (10) adjacent the opening (12);

a concave channel (22) defining a cavity (24);

a resilient compressible backing material (34) positioned in said cavity (24);

a front surface mirror (20) positioned in said cavity (24) adjacent said resilient compressible backing material (34) with the reflective surface (21) of said mirror (20) disposed toward said opening (12) and adjacent said first surface;

means (18, 32) for securing said channel (22) to said mounting plate (10) with said reflective surface (21) of said mirror (20) being positioned adjacent and exposed through the mirror opening (12) defined by said mounting plate (10);

said mounting plate (10) defines at least two holes (18) spacially located around said opening (12);

said channel (22) defines at least two mounting tabs (32) for placement into said holes (18) defined by said mounting plate (10) so that when said tabs (32) are deformed after positioning into said holes (18) the channel (22) will be secured to said mounting plate (10);

said channel (22) is "U" shaped having a generally flat bottom wall (26) and two parallel side walls (28, 30) extending from said bottom wall (26) in a first direction; and

each of the ends of said walls (28, 30) have at least one of said mounting tabs (32) for entry into the holes (18) defined by said mounting plate (10).

4,372,520

SUSPENSION FOR THREE-AXIS ACCELEROMETER

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,541

Int. Cl.³ G01P *15/02*; F16M *13/00*

U.S. Cl. 248—604 **9 Claims**

1. An instrument, comprising:

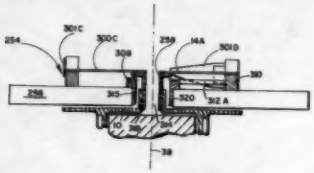
(a) a base member;

(b) a suspended member having a central longitudinal axis; and

(c) elastic suspension means for maintaining the position of said suspended member relative to said base member, wherein said elastic suspension means comprises:

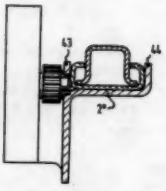
(1) a mounting frame, comprising:

(i) a central hub attached to said base and substantially centered on said longitudinal axis;
(ii) a plurality of spokes spaced apart from each other attached to and extending outward from said hub; and
(iii) a mounting ring attached to said spokes substantially centered on said longitudinal axis, wherein said



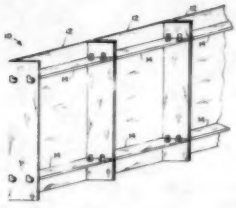
mounting ring has a radius larger than the radius of said hub; and
(2) an array of support filaments, wherein an inward portion of each of said support filaments is attached to said suspended member, and wherein an outward portion of each of said support filaments is attached to said mounting ring.

4,372,521
ADJUSTING MECHANISM FOR THE SEAT OF AN AUTOMOBILE
Hans Rampel, Eicha; Peter Hess, and Volkmar Schulz, both of Coburg, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany
Continuation of Ser. No. 888,503, Mar. 20, 1978, Pat. No. 4,228,981. This application Oct. 16, 1979, Ser. No. 85,308
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713693
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—430 **5 Claims**



1. An adjustment mechanism for a sliding seat such as a motor vehicle seat, comprising carriers elongated in the direction of sliding seat movement, a seat shifting guide arrangement supported on said carriers for adjustment in the direction of sliding seat movement, each carrier having integrally connected upwardly extending flanges for laterally supporting said seat shifting guide arrangement, said seat shifting guide arrangement comprising an upwardly open U-shaped track supported on each said carrier with the upper edges of the U-shaped track being bent inwardly toward one another, a downwardly open U-shaped track being located within said upwardly open U-shaped track and arranged to support the sliding seat, said downwardly open U-shaped track having the lower edges thereof bent outwardly within and slidably guided in contact with said upwardly open U-shaped track, and said upwardly extending flanges on said carrier laterally supporting the upwardly extending outside surfaces of said upwardly open U-shaped track, said upwardly extending flanges are punched out of said carrier in a lug-like form and are bent upwardly therefrom into laterally supporting contact with said upwardly open U-shaped track, and said lug-like upwardly extending flanges comprise a number of said flanges extending along said carrier in the direction of sliding seat movement with said lug-like flanges on opposite sides of said upwardly open U-shaped track being offset relative to one another in the direction of sliding seat movement.

4,372,522
SECTIONAL WALL FORM SYSTEM
George Simeonoff, 191 King St., Weston, Ontario, Canada (M9N 1L8)
Filed Feb. 9, 1981, Ser. No. 232,964
Int. Cl.³ E04G *11/08, 17/04*
U.S. Cl. 249—18 **14 Claims**



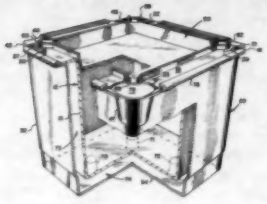
1. An interlocking sectional wall form system, comprising in combination:
first and a second channel panels, each of said channel panels having a face portion and a first and a second side portion angularly disposed from said face portion;
first and second channel locking aperture means located in said first and second side portions of said channel panels;
first and second detachable lock brackets;
said first lock bracket being adapted for insertion between said first and second side portions of said first channel panel, said second lock bracket being adapted for insertion between said first and second side portions of said second channel panel;
each of said lock brackets including a first and second side portion;
locking rod means connected to said second side portion of each of said lock brackets; and
means for connecting said locking rod means of said first lock bracket through said second locking aperture means of said first channel panel and through said first locking aperture means of said second channel panel for securing said first and second channel panels in an adjacent relationship and means for simultaneously securing said locking rod to said first side portion of said second lock bracket.

4,372,523
ICE MAKING CONTAINER APPARATUS
Billy R. McCartney, 8305 Londonderry, Dallas, Tex. 75228
Filed Aug. 24, 1979, Ser. No. 69,265
Int. Cl.³ B28B *7/34;* F25C *1/04*
U.S. Cl. 249—79 **4 Claims**

1. Ice making apparatus for producing a removable ice block comprising:
a first container for receiving water to be frozen in the form of said ice block;
a second container larger than said first container for receiving said first container;
support means between the walls of said first and second containers for spacing said first container from said second container to form a space between the walls of said first and second containers;
receptacle means in the wall of said second container for receiving warm fluid into said space to warm the walls of

the first container and enable removal of said ice block therefrom; and

a cover member having means for engaging the walls of said



first container to enclose the top of said first container, said cover member including spout means opening toward said receptacle means for directing the warm fluid into said receptacle means.

4,372,524

MOULD FOR PRODUCING PROFILED ELEMENTS OF PLASTICS MATERIAL

Jean-Yves Pailler, Sugeres, France, assignor to Etablissements EVIRA, France

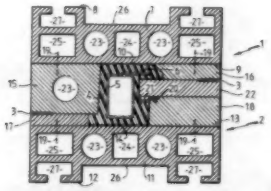
PCT No. PCT/FR80/00177, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01682, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 5, 1980, Ser. No. 287,755

Claims priority, application France, Dec. 6, 1979, 79 30006; Nov. 21, 1980, 80 24810

Int. Cl.³ B29D *27/04*; B29C *6/00*

U.S. Cl. 249—79 **24 Claims**



1. Mould for producing elongated profiled elements of plastics material, notably of high density polyurethane with a thin construction and integral skin, comprising:

an upper half-mould and a lower half-mould, said two half-moulds being separated by a joint plane and each having lateral faces parallel to said elongated element and transverse ends;

said half-moulds being respectively associated with tightening means and defining together the impression of a profiled element to be moulded from said plastics material;

each of said half-moulds comprising a shoe having an outer surface and an inner surface;

said outer surface including removable fastening means cooperating with said tightening means;

said inner surface being parallel to said joint plane and forming the bottom of said impression;

interchangeable profile-defining members respectively fixed to said inner surface and forming the sides of said impression;

at least one passage in said shoe for the circulation of a fluid for maintaining the temperature of formation of said plastics material at a substantially constant value.

4,372,525

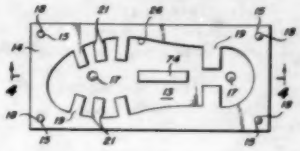
INSOLE, APPARATUS FOR MOLDING AND METHOD OF MAKING SHOES

Curtis A. Uhlig, P.O. Box 4412, Harrisburg, Pa. 17111

Filed Jun. 5, 1980, Ser. No. 156,804

Int. Cl.³ B29C *1/02*

U.S. Cl. 249—102 **5 Claims**



1. An injection mold for making plastic insoles designed to have a specific thickness and quite irregular configuration adapting it for attachment to unit sole structures and the ends of vamp and heel means for a pair of shoes, comprising a pressure containing mold means which includes a first platen and a second platen moveable relatively toward each other to close the mold means and being adapted to contain a plastic molding pressure, and away from each other to an open position to permit a molded insole to be removed from the mold means, a base plate, a first apertured mold sheet having substantially planar surfaces adapted to be fixedly secured in a precise position relative to said base plate and a second apertured mold sheet having substantially planar surfaces adapted to be secured in a precise position relative to said first sheet, the peripheries of said apertures in each of said first and second mold plates coinciding to form the peripheries of the insoles produced therein, said first mold sheet having integral land means extending inwardly into its aperture to form recesses to receive the ends of said vamp and heel means, said platens holding said base plate and apertured mold sheets in a juxtaposed position when said mold means is closed whereby they cooperate to provide a mold cavity, means to feed a plastic to be molded into the mold cavity thus provided, and the combined thickness of said apertured mold sheets being equal to the designed thickness of an insole, and the molded insole being removed from between said platens when they are moved to said open position.

4,372,526

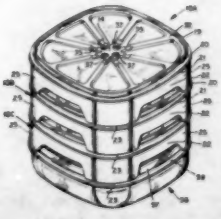
ICE CUBE MAKING APPARATUS AND SERVING SYSTEM

Robert H. C. M. Daenen, Hekelgem, Belgium, and Erik Herlow, Tikob, Denmark, assignors to Dart Industries, Inc., Northbrook, Ill.

Filed Sep. 17, 1981, Ser. No. 280,854

Int. Cl.³ F25C *1/24*

U.S. Cl. 249—119 **8 Claims**



1. Ice cube making apparatus comprising: means having an outer periphery and defining within said periphery a plurality

of freezing compartments each capable of holding a certain amount of liquid; and

drain means located on said first-mentioned means to receive the gravity flow of liquid supplied to said freezing compartments in excess of said certain amount, and including an opening within said periphery so that the excess liquid drains to a location below said freezing compartments.

4,372,527

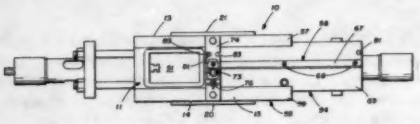
BLOWOUT PREVENTER

Irwin Rosenhauch, Rockwell, and Gary D. Ellis, Richardson, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 5, 1980, Ser. No. 146,576

Int. Cl.³ E21B *33/06*

U.S. Cl. 251—1 A **20 Claims**



2. In a blowout preventer including a housing with a plurality of interconnected sides defining a hollow interior containing opposed rams with sealing blocks thereon for movement toward each other to seal against tubing extending through the housing, and a door mounted on to said housing and normally closing an opening in one of said sides and through which access is provided to the interior of said housing, the improvement comprising, the door guide connected to said housing and located generally within a plane paralleling said one side, said door being connected with said guide against substantial movement in a direction generally perpendicular to said plane, door sliding means connected between said housing and said door for moving said door in a generally edgewise direction between a first position covering said opening and a second position exposing said opening to allow access to the interior of said housing and a sealing member associated with said opening and acting between said housing and said door when closed to seal against pressure leakage from within said housing.

4,372,528

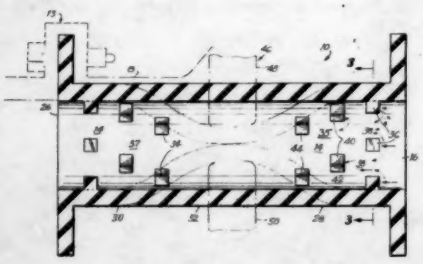
PINCH VALVE SLEEVE

Spiros G. Raftis, Pittsburgh, Pa., assignor to Red Valve Co., Inc., Pa.

Filed Jul. 6, 1981, Ser. No. 280,827

Int. Cl.³ F16L *55/14*

U.S. Cl. 251—4 **11 Claims**



1. In a pressure-reducing pinch valve adapted to be mounted in a hollow valve arrangement having pinching means, said arrangement being adaptable for interposition in a conduit system adapted for conveying pressurized fluid material, a hollow, flexible, resilient elongated valve sleeve body fabricated in one piece from a resilient elastomeric material with an inner surface bounding a flow-through passage for the pressurized fluid material, said sleeve body having:

(a) means providing an inlet opening at one end for permitting ingress of fluid material at a predetermined pressure into the flow-through passage;

(b) means providing an outlet opening at an opposite end for permitting egress of fluid material at a reduced pressure that is lower than said predetermined pressure from the flow-through passage;

(c) an ingress section adjacent to the inlet opening;

(d) an egress section adjacent to the outlet opening;

(e) a pinchable intermediate section situated between said ingress and egress sections and constrictable by the pinching means; and

(f) means for reducing the pressure of the fluid material from said predetermined pressure to said reduced pressure, including a plurality of mutually spaced, radially extending, inwardly directed protrusions on the inner surface of the sleeve body and formed of one-piece elastomeric construction therewith, said protrusions being operative for reducing the pressure of the pressurized fluid material even when the pinching means is not operative to constrict the pinchable intermediate section, whereby greater control over the pressurized fluid flow is obtained regardless of the operation of the pinching means.

4,372,529

PLASTIC VALVE HAVING A CAP NUT COUPLER

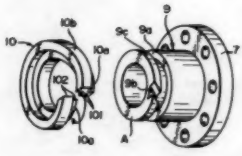
Shigenobu Kato, Asaka, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1981, Ser. No. 247,503

Claims priority, application Japan, Mar. 31, 1980, 55-43330[U]

Int. Cl.³ F16L *37/28, 25/00*

U.S. Cl. 251—151 **6 Claims**



1. In a valve formed of synthetic resinous material including a body having an end surface and a peripheral surface and a cylindrical body cap having a flange portion at one end and a seat at the other end, the body cap being coupled to the body by screwing a cap nut, movably surrounding the peripheral surface of the body cap, to engage the seat and the peripheral surface of the body and hold the body to the body cap at the end surface of the body, the improvement wherein:

the body cap includes a cylindrical element having a cylindrical disengagement-preventing end portion at the other end of the body cap having a free front end face formed in a first plane facing the end surface of the body, the body cap having an annular groove adjacent said disengagement-preventing end portion;

the body cap further comprising a ring-like element including a small diameter portion fittable into said groove, said small diameter portion having a first cylindrical inner surface having a first inner diameter; said ring-like element further comprising a large diameter portion having a second cylindrical inner surface having a second inner diameter greater than said first inner diameter and a radially extending front end surface, said ring-like element having such dimensions that when said small diameter portion is fitted in said annular groove, said second cylin-

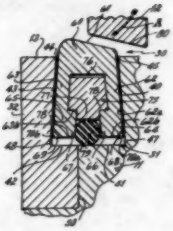
drical inner surface contacts the outer peripheral surface of said disengagement-preventing end portion and said radially extending front end surface lies in said first plane; said ring-like element having a cut defining two separable confronting surfaces, whereby said ring-like element is deformable around said cylindrical element to fit said small diameter portion into said annular groove and position said large diameter portion on said disengagement-preventing end portion; said ring-like element further having a rear wall forming the seat extending radially outwardly of the peripheral surface of said disengagement-preventing element and facing the one end of the body cap.

4,372,530

VALVE AND SEAL

Carl F. Livorsi, Warwick, R.I., assignor to Quartrol Corporation, Birmingham, Ala.

Filed Jun. 5, 1981, Ser. No. 270,910
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—173 **30 Claims**



1. Valve apparatus comprising:
a valve body having an interior surface defining a fluid passageway,
a valve disk for selectively closing said passageway,
a circumferential groove in said valve body extending from said surface radially outward into said valve body,
said groove having a bottom surface in said valve body and a tapered side wall,
a retainer ring disposed on said valve body and having a tapered surface defining another side wall of said groove and a surface defining a bottom of said groove,
said groove having a mouth at said interior surface, and being wider at its bottom than at its mouth,
a tapered, resilient seat ring disposed in said groove for sealingly engaging a periphery of said disk,
said seat ring having side legs, each substantially parallel to a respective tapered side wall of said groove, and said legs joined together at the mouth of said groove and normally extending through said mouth, forming a sealing portion,
a metallic back-up ring disposed between said seat ring legs, circumscribing said sealing portions, and spaced from said sealing portion, and
a resilient "O"-ring disposed between the bottom of said groove and said back-up ring and between ends of said legs.

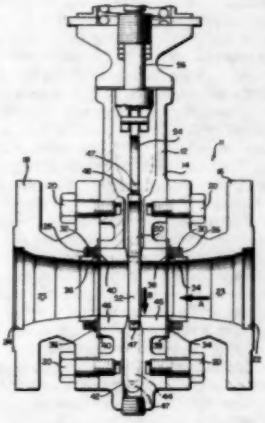
4,372,531

CERAMIC GATE VALVE AND COMPONENTS THEREFOR

M. Jack Rollins, and William P. Coppin, both of Muncie, Ind., assignors to Maxon Corporation, Muncie, Ind.

Filed Nov. 18, 1980, Ser. No. 207,858
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—174 **18 Claims**

1. An improved ceramic gate valve apparatus for controlling the flow of high temperature and corrosive fluids through a conduit pipe having a longitudinal dimension, said valve comprising:
a valve housing disposed on the conduit pipe, said valve housing having influent openings and effluent openings connected to said conduit pipe, said valve housing having a valve gate containing chamber internally thereof and disposed transverse to the longitudinal dimension of said conduit pipe;
a valve gate disposed in said valve gate containing chamber for reciprocating movement between a first position to open said valve and a second position to close said valve and positions intermediate said first and second positions for reduced and controlled flow through the conduit pipe, said valve gate comprised of a ceramic material and defining a slab shape of relatively lesser width in the direction of the longitudinal dimension of said conduit pipe and relatively greater width in the transverse dimension, said valve gate having a valve gate aperture therein for permitting flow therethrough when the valve gate is disposed in said first position, said valve gate having a solid portion disposed opposite said valve gate aperture for closing said valve when said valve gate is in said second position;

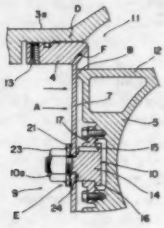


a pair of valve seats each of which is disposed on an opposite side of and engages said valve gate, said valve seat comprised of a ceramic material, each said valve seat having an opening therein to permit flow from the conduit pipe therethrough when said valve gate is in the first position, each said valve seat being substantially stationary in the transverse dimension and each said valve seat being disposed for inward urging in the longitudinal direction for snug engagement with said valve gate;
reciprocating means connected to said valve gate for disposing said valve gate between said first and second positions to open and close respectively said valve;
compression means surrounding said ceramic valve gate for providing an inwardly compressive force to the peripheral surface thereof to increase the strength thereof; and
ceramic springs disposed exterior of each said valve seat for urging the valve seat pair inwardly toward and into engagement with said ceramic valve gate with sufficient force to effect a slideable but sufficiently snug engagement, and to prevent leakage of the conducted material around the engagement seal between said ceramic valve seat and said ceramic valve gate.

4,372,532
VALVE

Ryozo Yamamoto; Keiichi Yanase, and Junzo Oku, all of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 13, 1979, Ser. No. 93,775
Claims priority, application Japan, Nov. 14, 1978, 53-140763; Mar. 15, 1979, 54-30701
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—175 4 Claims



1. A valve comprising a valve housing, a fluid passage in said valve housing, a tubular valve closure member having an inner diameter substantially equal to the diameter of said fluid passage within said valve housing, said tubular valve closure member being mounted to be rotatable around an axis normal to the direction of the fluid flow within said valve housing, an elastically flexible, substantially disc-shaped diaphragm including a central connecting portion which is secured to a central portion of said valve closure member by a keying means for axial movement relative thereto, a valve seat provided within the valve housing, said disc-shaped diaphragm having a contact surface which contacts said valve seat, the contact surface being spherically shaped to correspond to a portion of a surface of an imaginary sphere having its center at the intersection of the rotational axis of the valve closure member and the central axis of the disc-shaped diaphragm, said valve closure member including a first annular stopper means which is in contact with an annular portion of said disc-shaped diaphragm adjacent to a portion thereof which contacts said valve seat when said tubular valve closure member, is closed, said annular stopper means coacting with said disc-shaped diaphragm for arresting said disc-shaped diaphragm and controlling flexion of said disc-shaped diaphragm under fluid pressure, wherein said movable central connecting portion of said disc-shaped diaphragm is keyed to said valve closure member to shift in a direction along the central axis thereof under fluid pressure.

4,372,533
PNEUMATIC LIFT PAD

Ernest Knaus, Akron; Paul E. Liggett, Wooster, and Raymond J. Namsick, Akron, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

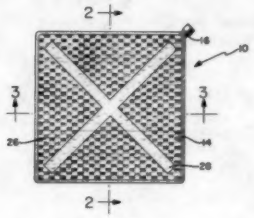
Continuation of Ser. No. 151,049, May 19, 1980, abandoned.
This application Mar. 12, 1982, Ser. No. 357,365
Int. Cl.³ B66F *3/24*
U.S. Cl. 254—93 HP 15 Claims

1. A press-molded, high-pressure, pneumatic lift pad including two substantially rectangularly-shaped, cord-reinforced, elastomeric covers enclosing an expansion chamber comprises:

a first reinforcement fabric comprised of a plurality of parallel cords, each of said cords being continuous from one cover through two opposite peripheral edges with the ends terminating in the opposite cover and overlapping at least 75% of the cover from one edge to the other;

a second reinforcement fabric comprised of a plurality of parallel cords, each of said cords being continuous from one cover through two opposite peripheral edges with the ends terminating in the opposite cover and overlapping at least 75% of the cover from one edge to the other, the cords of the second reinforcement fabric being orthogonally oriented with respect to the cords of the first reinforcement fabric and the lapped ends of each of the reinforcement fabrics being embedded in elastomer of the opposite cover such that each cover is comprised of at least three reinforcement cord plies and the cords of two of the plies are oriented orthogonally with respect to the other of the plies;

at least one ply of reinforcement fabric comprised of a plurality of parallel cords embedded in elastomer and positioned laterally in the peripheral edges of the pad so as to be orthogonal to the cords of the first and second reinforcements which pass through the peripheral edges;



at least one ply of a square woven fabric embedded in the peripheral edges of the pad inwardly of the other reinforcement cord fabrics;

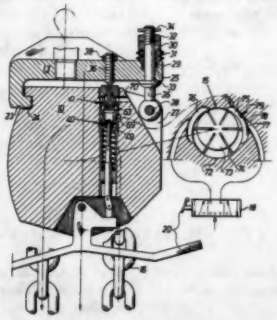
a ply of a release material adhered to the inside surface of at least one of the covers; and

a valve mounted in at least one of the corners of the pad and having a nipple portion protruding from the corner thereof for connection to a source of high pressure fluid, said nipple terminating in a substantially flat, triangular-shaped base embedded in elastomer and the taper of the base is substantially parallel to the edges of the pad such that the cords of the reinforcement fabrics form crossed-cords which entrap the triangular base within the pad structure.

4,372,534
PNEUMATIC HOIST

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 24, 1981, Ser. No. 247,068
Claims priority, application Sweden, Mar. 28, 1980, 8002408
Int. Cl.³ B66D *1/08, 1/48, 3/24*
U.S. Cl. 254—269 11 Claims



1. In a pneumatically operated hoist comprising a housing (10) provided with a suspension means (12, 13) for suspension

of the hoist, a pneumatically driven motor (15) provided with a first flow passage (75) arranged for serving as a pressurized air inlet during raising of a load and as an air exhaust passage during lowering of the load and a second flow passage (76) arranged for serving as an air exhaust passage during raising of the load and a pressurized air inlet during lowering of the load, a load engaging means (16, 17) drivingly connected to the motor (15), and control means (18) coupled to said motor for regulating air flow to and from the motor (15);

the improvement wherein:

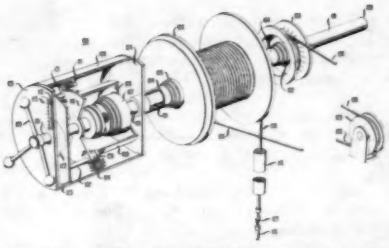
said control means includes a flow restricting means (77, 78) provided in said first flow passage (75) and arranged for restricting flow through said first flow passage (75) during lowering of the load; and a load sensitive shunt valve (4) arranged for providing a second air exhaust passage (69, 70) during lowering of a load having a weight below a predetermined magnitude and for closing said second air exhaust passage (69, 70) during lowering of a load having a weight greater than said predetermined magnitude.

4,372,535

APPARATUS FOR ADJUSTING CABLE TENSION

David W. Gibson, Chester; Albert L. Hale, Berkeley Heights; Daniel L. Pope, Chester; Donald R. Rutledge, Budd Lake, and Kirk P. Wells, Glen Gardner, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1980, Ser. No. 181,056
Int. Cl.³ B66D 1/76
U.S. Cl. 254—319 5 Claims



1. A capstan winch for pulling cable through conduit comprising

a source of rotary power, an overload clutch having a driving side connected to the source of rotary power and having a driven side, a winch line, a capstan connected to the driven side of the overload clutch for applying traction to the winch line, a slip clutch having a driving side connected to the source of rotary power and having a driven side, a take-up reel connected to the driven side of the slip clutch,

characterized in that

the capstan winch (100) includes means for measuring the torque applied to the capstan (103) and the take-up reel (106) comprising an inner drum (109) connected to the source of rotary power, a tension spring (111 or 124), an outer drum (108) concentric with the inner drum (109) and connected to the inner drum (109) by the tension spring (111 or 124), a disc (123) concentric with the inner drum (109) and connected to the inner drum (109), a window (112) in the outer drum (108), a pattern (122) on the disc (123) visible through the window (112), and a tube (104) connects the driving side of the overload clutch (102) and the driving side of the slip clutch (105) to the outer drum (108)

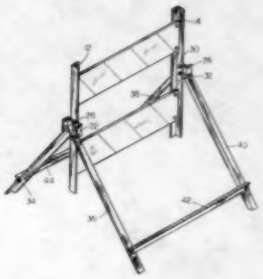
whereby the torque is indicated by the relative position of the pattern (122) with respect to the window (112).

4,372,536

TRAFFIC BARRICADE

Randall L. Morse, Waverly, Nebr., assignor to Trafcon, Inc., Lincoln, Nebr.

Filed Mar. 6, 1981, Ser. No. 241,251
Int. Cl.³ E01F 13/00
U.S. Cl. 256—64 2 Claims



1. A portable barricade, comprising,

first and second frame members normally being vertically disposed and horizontally spaced with respect to each other and having upper and lower ends,

at least one barricade panel secured to and extending between said first and second frame members and normally dwelling in a vertical plane,

first and second legs, having upper and lower ends, pivotally secured at their upper ends to said first frame member,

third and fourth legs, having upper and lower ends, pivotally secured at their upper ends to said second frame member,

said first and second legs being selectively movable from a storage position wherein said first and second legs are substantially parallel to said first frame member to an operative position wherein said first and second legs extend downwardly and outwardly from said first frame member,

said third and fourth legs being selectively movable from a storage position wherein said third and fourth legs are substantially parallel to said second frame member to an operative position wherein said third and fourth legs extend downwardly and outwardly from said second frame member,

and means operatively interconnecting said legs and said frame members which maintains said frame members and said panel in their vertically disposed position when said legs are in their said operative position,

said means interconnecting said legs and frame members comprising channel-shaped members positioned between said legs and frame members,

each of said channel-shaped members comprising a vertically disposed base secured to the respective frame member and a pair of side walls extending outwardly from said base,

said legs being pivotally secured to said channel-shaped members and frame members below the connection of the associated channel-shaped member and frame members.

4,372,537

METHOD AND APPARATUS FOR THE REPLACEMENT OF BOTTOM CLOSURES OF TRACK-MOUNTED TRANSFER LADLES

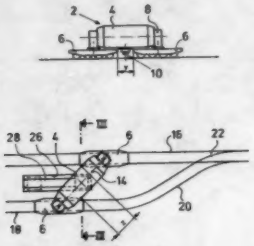
Bernhard Dür, Oetwil am See, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed Nov. 25, 1981, Ser. No. 324,948

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046194

Int. Cl.³ C21B 3/00

U.S. Cl. 266—45 8 Claims



1. A method for the replacement of a bottom closure of a track-mounted pugh-type transfer ladle having a transfer container supported by two longitudinally spaced-apart bogies which are pivotally attached to the transfer container for swinging movement about a vertical axis, said transfer container having a removable bottom closure located between said bogies, said method comprising: moving the ladle longitudinally of itself and directing the two bogies on to different tracks which are spaced from each other to thereby swing the bogies relative to the transfer container and increase the longitudinal space beween the bogies; and replacing the closure from below through said increased space.

4,372,538

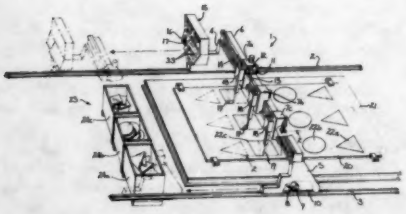
METAL CUTTING MACHINE WITH CUT PIECE PICKUP AND TRANSPORT MAGNETS

Fredrick J. Balfanz, Waukesha, Wis., assignor to C-R-O, Inc., Menomonee Falls, Wis.

Filed Jan. 5, 1981, Ser. No. 222,576

Int. Cl.³ B23K 7/10

U.S. Cl. 266—69 5 Claims



1. In a machine for cutting a plurality of separate pieces from a metal workpiece:

(a) longitudinally extending support means,

(b) a plurality of carriages adapted to be positioned adjacent the workpiece and movable in a transverse direction,

(c) cutting tools mounted on said carriages for forming a plurality of individual cut pieces from the workpiece,

(d) a transversely extending bridge adapted to be positioned adjacent the workpiece and movable along said support means, said carriages being mounted for movement along said bridge,

(e) a plurality of electromagnetic means comprising magnet assemblies mounted on said carriages for selectively picking up said cut pieces from said workpiece,

(f) means for moving said bridge and electromagnetic means from adjacent the workpiece to a station remote from the said workpiece,

(g) and means for activating said electromagnetic means for cut-piece pickup, and for de-activating said electromagnetic means for release of the cut pieces at said remote station.

4,372,539

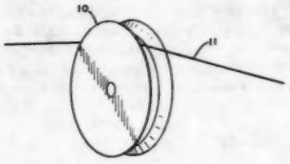
RENEWABLE, STRAND CENTERING ANNEALER SHEAVE

Ralph E. Starnes, Jr., Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Jun. 2, 1981, Ser. No. 269,176

Int. Cl.³ C21D 9/62; H05B 3/00

U.S. Cl. 266—104 10 Claims



1. In a system for annealing strand of the type comprising at least two sheaves across which said strand passes and becomes electrically annealed, the improvement comprising:

a first flange member;

a second flange member concentric with said first flange member and adjacent thereto; and

an annealing band positioned between said first and second flange members and forming the bottom of a sheave groove;

further provided that said annealing band comprises an inward crowned central groove which physically guides said strand centrally.

4,372,540

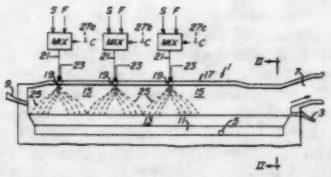
APPARATUS FOR OXYGEN SPRINKLE SMELTING OF SULFIDE CONCENTRATES

Paul E. Queneau, Cornish, N.H. 03746, and Reinhardt Schuhmann, Jr., 1206 Hayes St., West LaFayette, Ind. 47906

Division of Ser. No. 971,995, Dec. 21, 1978, Pat. No. 4,236,915. This application Sep. 3, 1980, Ser. No. 183,963

Int. Cl.³ F27B 9/00; C22B 9/10

U.S. Cl. 266—171 7 Claims



1. In a furnace of refractory material, for converting nonferrous metal sulfide concentrates to molten matte, with means to contain a charge of molten matte and a superimposed slag layer, means for discharging molten matte, slag and exhaust gases therefrom, and the furnace having a roof to enclose a hot

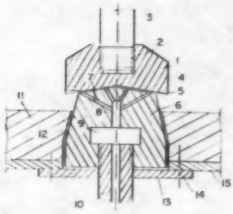
atmosphere in said furnace between the roof and slag layer, and having a plurality of burners for introducing metal sulfide concentrates, flux and oxygen-rich gas as paraboloidal suspensions therefrom, and means for introducing metal sulfide concentrate, flux and oxygen-rich gas to said burners, the improvement wherein said furnace is a horizontal elongated rectangular cross-section furnace having said means for discharging slag at one end thereof, and said plurality of burners are vertically disposed, in spaced relation, along the longitudinal axis of said roof at a location remote from said means for discharging slag, and said burners are so spaced from each other as to introduce said oxygen-rich gas and said concentrates into said hot atmosphere as a plurality of paraboloidal suspensions which form a pattern of broad, substantially contiguous ovals upon contact with the slag, whereby substantially uniform heat and mass distribution is effected over the major portion of said horizontal furnace and remote from said means for discharging slag.

4,372,541

APPARATUS FOR TREATING A BATH OF LIQUID METAL BY INJECTING GAS

Francois Bocourt, Sydney, Australia, and Henri Fetaud, Chambery, France, assignors to Aluminum Pechiney, Lyons, France

Filed Sep. 21, 1981, Ser. No. 303,868
Claims priority, application France, Oct. 14, 1980, 80 22193
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—220 **15 Claims**



1. Apparatus for treating a bath of liquid metal by injection of a gas comprising a container for housing the liquid metal, a gas injection plug at the bottom of the container, an agitator mounted for rotational movement within the container, means mounting the agitator for vertical movement in the direction toward and away from the plug between rest position on the gas injection plug and raised position spaced from the gas injection plug responsive to gas emission from the plug, whereby the agitator is supported in raised position by a fluid bearing to enable rotational movement of the agitator in raised position while allowing a multitude of dispersed bubbles of the gas to escape through the space between the separated agitator and plug, and means for rotating the agitator about the axis.

4,372,542

COPPER SLAG TRAP

E. Henry Chia, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

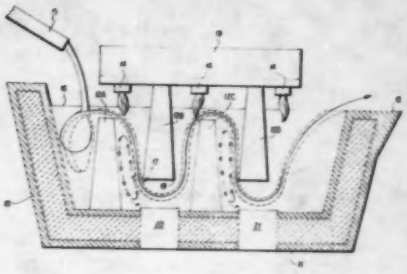
Filed Jun. 19, 1981, Ser. No. 275,554
Int. Cl.³ B22D *43/00*
U.S. Cl. 266—229 **17 Claims**

1. A copper slag trap for continuously trapping slag during transfer of molten copper from a melting means to a casting means comprising:

(a) a tundish having a bottom and sides adapted to receive a molten metal melt through a melt entrance and to maintain said melt as the melt flows through said tundish to a melt exit;

(b) a top member positioned above said tundish; and

(c) at least two melt flow obstacles situated above said tundish bottom, below said top member, and between said entrance and said exit, said obstacles being adapted to project into said melt flow in a predetermined pattern and alternately restrict and release said melt flow to induce



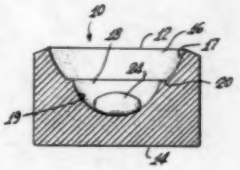
non-uniform flow patterns therein thereby causing slag particles trapped in the molten metal matrix to rise to the surface of the molten metal.

4,372,543

CUPEL

Philip M. Gardiner, P.O. Box 5, Parlin, Colo. 81239

Filed May 14, 1981, Ser. No. 263,601
Int. Cl.³ F27B *14/10*; C22B *11/00*, *13/00*
U.S. Cl. 266—275 **9 Claims**



1. A cupel comprising a body in which there is a downwardly extending primary cavity, and disposed within said primary cavity, a downwardly extending secondary cavity which extends beyond the lowest extreme of said primary cavity, said primary cavity being substantially hemispherical, and said secondary cavity being substantially hemispherical and symmetrically disposed within said primary cavity.

4,372,544

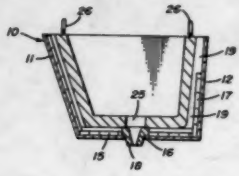
BLAST FURNACE TROUGH AND LINER COMBINATION

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed May 7, 1981, Ser. No. 261,678
Int. Cl.³ C21B *3/00*
U.S. Cl. 266—281 **10 Claims**

1. An improvement in a blast furnace trough and liner combination for handling hot metal, the improvement comprising a replaceable and expendable liner and cushioning and insulating means supporting the same, said blast furnace trough including an open topped apertured metallic vessel, said replaceable and

expendable liner comprising a multi-layered mass coalesced by physical force with each of said multi-layers being of a different density and having a known predetermined lifetime when subjected to molten metal flowing thereover.



4,372,545

SHOCK ABSORBER FOR A VEHICLE WITH A FLEXIBLE SUSPENSION

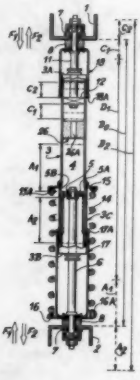
Jean M. Federspiel, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 129,385, which matured from PCT/FR79/00008 Jan. 26, 1979, 102(e) date Aug. 15, 1979, abandoned. This application Aug. 13, 1981, Ser. No. 292,519

Claims priority, application France, Jan. 26, 1978, 78 02171; Dec. 12, 1978, 78 34901

Int. Cl.³ F16F *13/00, 9/19*

U.S. Cl. 267—8 R **6 Claims**



1. A hydraulic shock absorber for a vehicle with a flexible suspension, comprising:

a damping piston member slidably mounted in a first cylinder member containing a liquid immersing the damping piston member;

at least one return spring bearing simultaneously on said damping piston member and on said first cylinder member to maintain at rest the damping piston member in a predetermined position relative to the first cylinder member to allow the latter to effect a useful travel inside said first cylinder member in each direction;

a compensation piston member slidably mounted in a second cylinder member communicating with said first cylinder member and containing said liquid, said compensation piston member being immersed in said liquid, said predetermined position of the damping piston member being independent of the position of the compensation piston member;

at least one of said piston members being integral with a sliding rod traversing one end of said cylinder member in which said one piston member is slidably mounted;

means for compensating variations of an internal volume defined in said cylinder member resulting from sliding of said sliding rod into and out of said cylinder member;

one of said damping piston and first cylinder members being integral with one of said compensation piston member and second cylinder member, whereas, the other of said members are fixed respectively to a suspended part and an unsuspended part of the vehicle;

at least one passage extending through said compensation piston member, said passage being controlled by at least one sealing valve sensitive to a relative displacement speed between said parts of the vehicle to open said passage when said relative displacement speed is below a given limiting speed, in order to allow a displacement of said compensation piston member inside said second cylinder member when the load of the vehicle varies, and to seal said passage when said relative displacement speed exceeds said given limiting speed, in order to prevent said compensation piston member from moving inside said second cylinder member when the relative displacement between said parts of the vehicle should be damped, the location of said damping piston member relative to said first cylinder member being independent of the load of the vehicle.

4,372,546

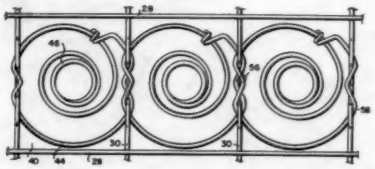
SPRING ASSEMBLY

Henry R. Ramsey, Dudley, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Mar. 23, 1981, Ser. No. 247,347

Int. Cl.³ F16F *3/02;* **A47C** *23/053*

U.S. Cl. 267—100 **14 Claims**



1. A spring assembly comprising a base frame, a grid frame comprising a border wire of rectangular configuration and transversely and longitudinally-extending, right-angularly crossing grid wires attached at their ends to the border wire, said crossing grid wires defining longitudinally and transversely-aligned openings and a plurality of helically-coiled springs attached at one end to the base frame and at their other ends to the grid wires in rows transversely of the grid frame within the openings defined by the crossing grid wires characterized in that the ends of the coiled springs attached to the grid wires comprise loops of larger diameter than the distance between the wires defining the openings within which the coils are positioned so that segmental portions of the end loops cross the grid wires in overlapping relation into the adjacent openings and wherein there is a deviation in one at least of the segmental portions of each coil which recrosses the grid wires in the opposite direction.

4,372,547

SHEET FEED APPARATUS

Nobuyuki Yanagawa, and Kenichi Mizuma, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 88,986, Oct. 29, 1979, abandoned. This application May 18, 1981, Ser. No. 264,761

Claims priority, application Japan, Dec. 29, 1978, 53-165265; Dec. 29, 1978, 53-165266

Int. Cl.³ B65H *3/06, 3/56*

U.S. Cl. 271—10 **13 Claims**

1. A sheet feed apparatus including sheet support means for supporting a stack of sheets, a corner separator disposed at a

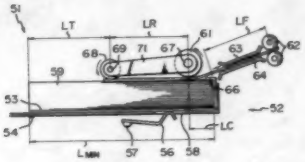
corner of the support means, a corner of the stack being aligned with the corner of the support means and a feed roller disposed adjacent to the corner of the support means for feeding a top sheet of the stack of sheets in a direction such that a leading edge of the top sheet is separated from the stack by the corner separator, characterized by comprising:

skew preventing means disposed upstream of the feed roller in the direction of movement of the top sheet for engaging with and preventing skew of the top sheet; and

a register roller disposed downstream of the skew preventing means in the direction of movement of the top sheet;

the skew preventing means comprising a skew preventing roller which is rotatable parallel to the feed roller;

the skew preventing roller being disposed between the feed roller and the corner separator in a direction perpendicular to the direction of movement of the top sheet;



the apparatus being adapted to feed sheets from stacks of sheets of a plurality of sizes, the apparatus further being constructed in such a manner that LT≧LF, where Lmin>LR+LC+LF and $Lmin=LT+LR+LC$, LR being a distance between the feed roller and the skew preventing roller, Lmin being a minimum length of the stack of sheets in the direction of movement of the top sheet which the apparatus is constructed to accommodate, LT being a distance between the skew preventing roller and a trailing edge of a stack of sheets of said minimum length, LC being a distance between the feed roller and a leading edge of the stack of sheets and LF being a distance between the leading edge of the stack of sheets and the register roller.

4,372,548

DEVICE FOR SEPARATING FLEXIBLE PLANAR MATERIAL

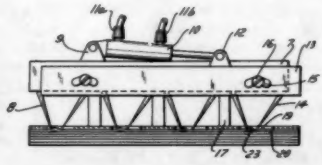
Horst Aurich, Karl-Marx-Stadt; Brigitta Bochmann, Lössnitz; Klaus Grosse, Berlin; Eberhard Köhler; Michael Nestler, both of Karl-Marx-Stadt; Hans-Christian Ochsenfarth, Mühlhausen, and Gerhard Seyfarth, Karl-Marx-Stadt, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Filed Mar. 9, 1981, Ser. No. 241,887

Claims priority, application German Democratic Rep., Mar. 28, 1980, 220013

Int. Cl.³ B65H 3/22

U.S. Cl. 271—18.3 **5 Claims**



1. A device for separating a stack of planar material, piece by piece, comprising

(A) an immobile pin carrier,

(B) a series of pins affixed to said immobile pin carrier (A) at discrete intervals,

(C) a guiding element affixed to said immobile pin carrier (A),

(D) a mobile pin carrier,

(E) a series of pins affixed to said mobile pin carrier (D) at discrete intervals, said pins pointing downwardly toward the pins (B) of said immobile pin carrier (A) in a lateral direction and bent at a greater angle than the series of pins (B) of the immobile pin carrier (A), said series of pins (B) and (E) of both the immobile and mobile pin carriers (A) and (D) disposed in a common longitudinal vertical plane, and

(F) a hole on said mobile pin carrier (D) engaged with the guiding element (C) on said immobile pin carrier (B), said hole in the shape of a convex curved groove, whereby the mobile pin carrier (D) moves downwardly in the direction defined by the hole (F) and the guiding element (C) so that pins (E) grip a top layer of the stack forming a fold between pins (B) and (E), and the mobile pin carrier (D), following the direction defined by the hole (F) around the guiding element (C), is raised to reinforce formation of the fold in the top layer of the stack of planar material.

4,372,549

DEVICE AND A METHOD FOR WITHDRAWING ARTICLES IN THE FORM OF SHEETS FROM A STACK OF ARTICLES

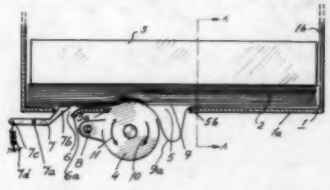
Allan Stiernspetz, Björkö Nykil, Sweden, assignor to Datasaab AB, Jarfalla, Sweden

Filed Apr. 21, 1981, Ser. No. 256,172

Claims priority, application Sweden, Apr. 25, 1980, 8003174

Int. Cl.³ B65H 3/30

U.S. Cl. 271—23 **7 Claims**



1. In a device for withdrawing articles individually from a stack of articles in the form of sheets, specifically banknotes, said devices including a magazine for receiving a stack of discrete articles in the form of sheets and having a bottom surface supporting said stack, a transverse width at least equal to the width of said articles, and a length at least equal to the length of said articles, said bottom surface defining two transverse openings each having a width at least equal to the width of said articles, and elongated roller means disposed in one of said openings and outside of the magazine for engaging an exposed article of the stack, said roller means being disposed to rotate first in one direction so that a bulge extending through said one opening is formed in said exposed article and thereafter in an opposite direction so that said exposed article is dispensed through the other opening, the improvements characterized by:

(a) the bottom surface of the magazine having the shape of a cylindrical segment adjacent to said one opening in a transverse direction, and

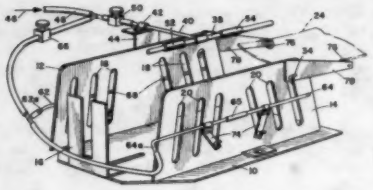
(b) the longitudinal contour of the roller means having the shape of a cylindrical segment complementary to that of the bottom surface of the magazine.

4,372,550

AIR FLOW DELIVERY SYSTEM

Kenneth D. Woods, 3158 Aurora Vista Dr., Spring Valley, Calif. 92077

Filed Apr. 30, 1981, Ser. No. 259,000
Int. Cl.³ B65H *31/00*
U.S. Cl. 271—211 **12 Claims**



1. A sheet stacking system comprising in combination:

a sheet receiving chute disposed for receiving individual flat rectangular sheets moving in succession from a machine;

air support means including a plurality of upwardly directed air support jets disposed at each side of said chute for engaging the underside of the sheet along the side edges thereof for supporting a sheet during movement of the sheet into the chute; and

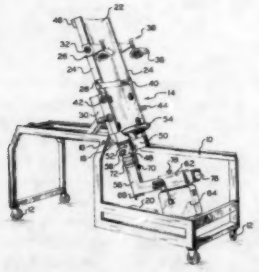
air pressure means for applying a continuous force on the upper surface along the center longitudinal axis of said sheet while said sheet is supported by said air support means during delivery into said chute for bending said sheet about its longitudinal axis for providing longitudinal support thereof and for rapidly forcing said sheet downwardly into said chute out of the way of succeeding sheets.

4,372,551

CARDIAC STRESS TABLE

Carl Yurdin, Port Washington, N.Y., assignor to Victoreen, Inc., Cleveland, Ohio

Filed Nov. 28, 1980, Ser. No. 211,266
Int. Cl.³ A63B *23/04, 69/6*
U.S. Cl. 972—73 **10 Claims**



1. A cardiac stress table comprising:

a frame;

a one-piece patient supporting table including a back support and extending through a seat portion, means for retaining a patient on said table, and means supporting a stress imposing unit integral with and extending longitudinally from said table;

means for pivotally interconnecting said table to said frame permitting rotation of said table and said stress imposing means from a generally horizontal position to a generally vertical position to effectively move a supported patient from a sublime position to an upright position during periods of examination; and

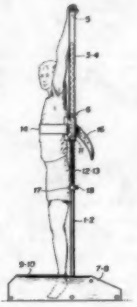
means for selectively positioning and maintaining said table relative to said frame through approximately ninety degrees to achieve adjustment of said supporting table at any position from the horizontal position to the vertical position.

4,372,552

HANG STAND FOR UNLOADING OF BACKBONE DISCS

Rolf Carlmark, Box 756, S-892 00 Domsjö, Sweden

PCT No. PCT/SE80/00021, § 371 Date Sep. 25, 1980, § 102(e) Date Sep. 25, 1980, PCT Pub. No. WO80/01540, PCT Pub. Date Aug. 7, 1980
PCT Filed Jan. 24, 1980, Ser. No. 197,106
Claims priority, application Sweden, Jan. 26, 1979, 7900723
Int. Cl.³ A63B *23/02;* A61H *1/02*
U.S. Cl. 272—112 **8 Claims**



1. In a hang stand for unloading the back and opening the spaces for the discs of the backbone of a person, comprising:

a pair of spaced apart, vertically arranged elongated members (**1, 3; 2, 4**); means (**7-10**) for supporting said elongated vertical members; and an upper bar (**5**) carried by and extending between said elongated vertical members, said upper bar (**5**) being located at such a vertical level that, when a person grasps said upper bar (**5**) with both hands, the person can hang freely;

the improvement comprising the combination of:

a back support (**11**) coupled to and engaged with said elongated vertical members so as to be movable downwards in a vertical direction relative to said vertical members but immovable in a horizontal direction relative to said vertical members, said back support (**11**) being arranged and located to engage against a given part of the back of the user to horizontally and immovably support said given part of the back but to permit vertical, downwardly directed, movement of said given part of the back along with said downward vertical movement of said back support (**11**) relative to said vertical members when the user grasps said upper bar (**5**) and hangs freely from said upper bar (**5**) with said given part of the back engaged against said back support (**11**);

adjusting means for infinitely variably adjusting the vertical position of said back support (**11**) in relation to said elongated vertical members, said adjusting means including infinitely movable stop means (**17,18**) coupled to said elongated vertical members; and springs means (**12,13**) coupled between said stop means (**17,18**) and said back support (**11**) to return said back support to its original location after use; and

vertically raised foot support means (**9,10**) connected to said support means (**7-10**) and arranged at the lower portion of said hang stand and on which a user may step for exact location of said back support (**11**) and from which a user

may step off to hang from said upper bar (5) freely but supported by said back support (11) and without his feet contacting the floor on which the hang stand rests.

4,372,553
WEIGHT LIFTING DEVICE AND METHOD OF EXERCISING
Frederick C. Hatfield, 502 Twenty-seventh St., Kenner, La. 70062
Filed Nov. 3, 1980, Ser. No. 203,417
Int. Cl.³ A63B 21/12
U.S. Cl. 272—119 13 Claims

1. An exercising device for exercising the abdominal muscles of the user by causing the user to contract them, comprising:

a support frame;

a seat having seat back means mounted on said support frame and against which the user sits and is supported for putting the abdominals on stretch before contracture of the abdominals which occurs during the exercising, said seat back means comprising a posteriorly curved, firm seat back which is substantially curved in the area where the user's spine is located causing the user's back to be hyperextended by being curved backwardly a significant amount when seated in the device;

force resistance means associated with said support frame for resisting but allowing the forward movement of the user in said seat when the user moves forwardly away from said seat back means to cause the abdominals to be contracted; and

moveable shoulder area connection means directly connected to said force resistance means for directly connecting the upper body, shoulder areas of the user to said force resistance means and for applying the force resistance of said force resistance means directly to the upper body, shoulder areas of the user in a direction opposite to the user's movement away from said seat back means but allowing the user to move forwardly against the force resistance.

10. The method of exercising the abdominal muscles of the body, comprising the following steps:

(a) providing an exercising device, including

a support frame;

a seat having seat back means mounted on said support frame, said seat back means comprising a posteriorly curved, firm seat back in the area where the user's spine is located during use;

restraining strap means associated with said support frame and said seat back means;

force resistance means associated with said support frame; and

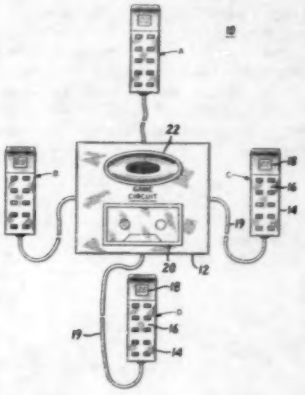
shoulder area connection means connected to said force resistance means;

(b) sitting in said seat and strapping said restraining strap means to firmly hold the user's posterior back against said curved seat back and toward its base at least generally isolating the abdominals from the hip flexor muscles, and directly connecting said shoulder area connection means directly to the shoulder area of the upper body to apply the force resistance of said force resistance means in a direction directly opposite to any movement away from said seat back means;

(c) leaning back against said curved seat back putting the abdominals in stretch before exercising; and

(d) cyclically moving the upper torso forwardly away from said seat back against the resisting force of said force resistance means and then back again, thereby exercising the abdominals, the abdominal muscles contracting concentrically to move the spine from spinal hyperextension, through extention, to flexion, then contracting eccentrically to move the spine from flexion, back through extention and back to hyperextension.

4,372,554
ELECTRONIC QUESTION AND ANSWER GAME
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Feb. 6, 1980, Ser. No. 118,992
Int. Cl.³ A63F 9/18
U.S. Cl. 273—1 E 1 Claim
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 86 Pages)



1. A multiple-player game apparatus, comprising:

a magnetic tape having recorded thereon sound signals, game program signals and location signals;

a magnetic tape playing apparatus having a tape motor for transporting said tape past a magnetic signal transducer, said tape motor being operative in response to motor control signals, said player providing output signals representative of said recorded sound signals, game program signals and location signals;

sound output apparatus responsive to supplied audio signals for providing a sound output;

a relay, responsive to output control signals, for selectively supplying said output sound signals or generated audio signals as audio signals to said sound output apparatus;

a plurality of keyboards, one for each of said multiple players, for generating input signals in response to key operations;

a plurality of alphanumeric display units, one for each of said multiple players, responsive to supplied numeric output signals;

a read-only-memory having a master system program;

a random access memory;

and a microprocessor, coupled to said read only memory, said random access memory, said tape playing apparatus, said sound output apparatus, said relay, said keyboards and said display units, said microprocessor being operative in response to said master system program to:

(1) supply motor control signals to said tape motor;

(2) store in said random access memory game program

signals supplied by said magnetic tape playing apparatus;

(3) operate under said master program and said stored game program to supply output control signals to said relay to cause said relay to supply said output sound signals to said sound output apparatus;

(4) operate, under said control program and said game program, and in response to said position signals supplied by said tape playing apparatus, to supply motor control signals to said tape motor to stop said tape motor at selected tape positions;

(5) operate under said control program and said game program, and in response to said input signals from said keyboards, to supply numeric output signals to said display units;

(6) operate under said control program and said game program, and in response to said input signals from said keyboards, to supply motor control signals to said motor to start said motor;

(7) operate, under said control program and said game program, and in response to said input signals and said position signals, to supply output control signals to said relay to cause said relay to supply selected portions of said sound signals to said sound output apparatus; and

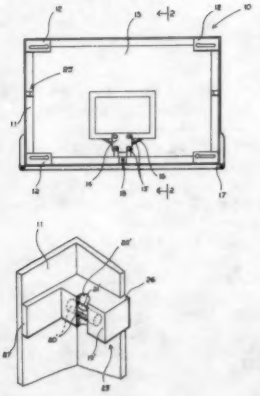
(8) operate, under said control program and said game program, in response to said input signals and said position signals, to generate audio signals and to supply output control signals to said relay to cause said relay to supply said generated audio signals to said sound output apparatus.

4,372,555

BASKETBALL BACKBOARD

Roald H. Sorensen, 3224 Marie Dr., Raleigh, N.C. 27604

Filed Oct. 9, 1981, Ser. No. 310,062
Int. Cl.³ A01B *63/08*
U.S. Cl. 273—1.5 R **10 Claims**



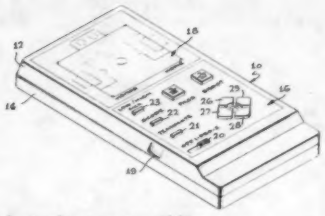
1. An improved basketball backboard generally vertically disposed above a playing surface and having end portions of the improvement, comprising: a first alignment indicating means secured adjacent one of said ends of said backboard; a second alignment indicating means secured adjacent the opposite end of said backboard from said first alignment indicating means; and means for adjusting the disposition of said backboard relative to said playing surface whereby both proper vertical alignment of said backboard as well as elimination of internal stress created by twist mounting and similar stress related conditions within said board can be eliminated.

4,372,556

ELECTRONIC SOCCER GAME

Michael D. Minkoff, Torrance, and Richard S. Chang, Rolling Hills Estate, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 8, 1980, Ser. No. 176,307
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—85 G **13 Claims**



1. An electronic game comprising:

means for simulating a playing field having indications arranged in a matrix of rows and columns representing offensive and defensive players and a ball;

means for initiating a pass of the ball by a first offensive player along a path beginning at a first indication and designated to end at a second indication if the ball is not intercepted or received;

means for designating the pass as a low pass or a high pass;

means for causing a defensive player to intercept the ball in a pass designated as a low pass if the defensive player and the ball are coincident at any indication along the path of the pass;

means for causing a defensive player to intercept the ball in a pass designated as a high pass only if the defensive player and the ball are coincident at the first indication or at the last indication, whereby the ball is capable of being intercepted only when it first leaves the possession of the first offensive player or only when it reaches the end of travel of the pass;

means for causing a second offensive player to receive the ball in a pass designated as a low pass if the second offensive player and the ball are coincident at any indication along the path of the pass; and

means for causing a second offensive player to receive the ball in a pass designated as a high pass only if the second offensive player and the ball are coincident at the first indication or at the last indication, whereby the ball is capable of being received only when it first leaves possession of the first offensive player or only when it reaches the end of travel of the pass.

4,372,557

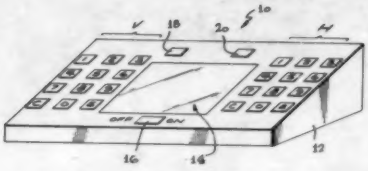
ELECTRONIC BASEBALL GAME

Robert M. Del Principe, Hawthorne, and David A. Reichert, Carson, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 2, 1981, Ser. No. 222,094
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—88 **5 Claims**

1. An electronic baseball game comprising a display having indicia representing a ball, a pitcher pitching the ball, and a batter swinging a bat; first input means responsive to operator control for assigning predetermined pitcher characteristics and for causing the pitcher to pitch the ball; second input means responsive to operator control for causing the batter to swing at the ball; and control means responsive to the first and second input means and including means for controlling the display indicia to simulate pitching, batting and movement of the ball, contact determining means for determining if the batter's swing causes the bat to contact the pitched ball, pitcher control

means responsive to the contact determining means for altering one of the predetermined pitcher characteristics if the ball is contacted by the bat said characteristic including pitcher arm

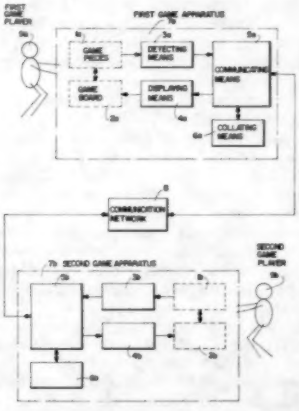


strength, and hit control means for determining the probability that the contacted ball is a successful hit as a function of the altered pitcher characteristic.

4,372,558
REMOTE GAME APPARATUS

Takeshi Shimamoto, Ashiya; Kazuo Arai, Neyagawa, and Kazutsugu Kobayashi, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 20, 1979, Ser. No. 96,175
Claims priority, application Japan, Nov. 21, 1978, 53-144839; Nov. 22, 1978, 53-144821
Int. Cl.³ A63F *3/00*; H04M *11/06*
U.S. Cl. 273—238 **7 Claims**



1. A remote game apparatus that enables players present at remote places to play a game by communicating via a common communication network, comprising:

detecting means for detecting a moved arrangement of a game piece on a game board and for providing a coded data signal;

communication means for communicating said coded data signal between two identical apparatus via said communication network;

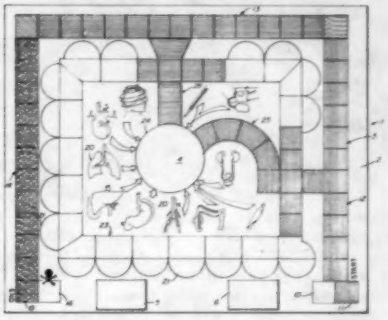
displaying means for displaying a moved arrangement of a game piece in response to said received coded data signal; and

collating means for collating the coded data signal, supplied from the detecting means by a reproductive action of a game player performed by watching the display of said displaying means, with the coded data signal received by said communication means, and for displaying the result of the collation.

4,372,559
EDUCATIONAL GAME FOR STUDENT AND/OR GRADUATE NURSES

Ann Summers, 650 Huntington Ave., Boston, Mass. 02115

Continuation-in-part of Ser. No. 956,037, Oct. 30, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,226
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—243 **1 Claim**



1. Means for learning, reinforcement, or updating knowledge through review for all levels of nurses from student nurses through graduate nurses in all academic preparations by means of a board game to be used by players who are said nurses comprising in combination a board having (1) a sequential path of spaces the sequence whereof passes through three levels of illness: Acute, Intermediate and Convalescence, (2) visualizations of body organs affected by wrongly chosen alternatives and of abnormalities of temperature and blood pressure and (3) designated areas for hospital departments, including an Admitting Office at the start of said sequence and a Discharge Office at the end of said sequence, each of said levels being indicated by printed matter on said board which designates certain spaces as Acute, certain spaces in Intermediate and certain spaces as Convalescence, the placement of said printed spaces being analogous to and vividly suggestive of the progress of a real patient; a plurality of playing pieces representing clients of said players; a multiplicity of admission playing cards having printed thereon information on certain aspects of a client's illness and alternatives for dealing with them, so that only a correct selection of alternatives will entitle a player to place her playing piece on the board at said Admitting Office, which is located so as vividly to suggest the location of a real admissions office; and a multiplicity of intervention playing cards having printed on one side thereof information on certain other aspects of a client's illness and alternatives for dealing with them, and having printed on the other side thereof (a) consequences of a correct selection of alternatives which direct the player to move playing piece on the board so that it progresses along said sequence toward said Discharge Office, and (b) consequences of an incorrect selection of alternatives which direct the player to impede such progress in a manner correlated to and vividly suggestive of the actual real-life consequence of that particular incorrect alternative, said printed matter on said intervention cards being correlated to the areas on said board and to the actual areas of a real hospital.

4,372,560
THERAPEUTIC GAME

John I. Antonius, 3848 SW. 36th Pl., Portland, Oreg. 97221

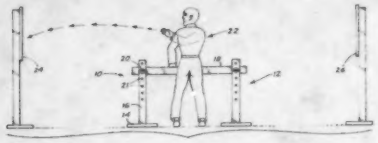
Filed Jul. 16, 1981, Ser. No. 283,952
Int. Cl.³ A63B *71/00*; A63F *9/02*
U.S. Cl. 273—408 **5 Claims**

1. A game comprising:

an elongate barrier and spaced means supporting opposite

extremities of the barrier in an elevated position which is at or above knee level of a participant in the game, such barrier establishing a forward facing position in a player's station located between the means supporting the ends of the barrier,

a target mounted in an elevated position beyond one end of said barrier thus to be spaced laterally to one side of a participant having said forward facing position in said player's station,



another target mounted in an elevated position beyond the other end of the barrier thus to be spaced laterally to the other side of a participant having said forward facing position in said player's station, and

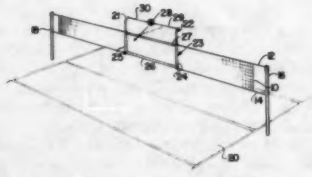
a hand-graspable missile adapted to be thrown by a participant having said forward facing position in said player's station alternatively toward said one target and said other target.

4,372,561

VOLLEYBALL PRACTICE APPARATUS

Steven R. Morgan, Ogallala, and Linda A. Carlson, North Platte, both of Nebr., assignors to Volleyball World, Inc., Ogallala, Nebr.

Filed Sep. 21, 1981, Ser. No. 303,847
Int. Cl.³ A63B *69/22*
U.S. Cl. 273—411 **15 Claims**



1. Volleyball practice apparatus comprising,

a pair of upright arms,

support means adapted to mount said arms adjacent a volleyball net in spaced apart relation to one another and each having a top end portion spaced above the volleyball net,

a pair of elongated cord members each having one end adapted to be secured one to the top end portion of each said arm,

flexible harness means adapted to receive and retain a volleyball,

said harness means having attachment means associated therewith on substantially diametrically opposed sides of a volleyball received therein, said attachment means being adapted to have the other ends of said cord members attached thereto to support said harness and a volleyball received therein above and spaced from one side of the top of the volleyball net,

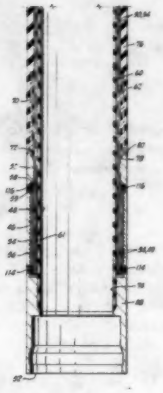
said cord members being elastically extensible to permit a volleyball supported in said harness to be projected across the net and having sufficient elastic resilience to return the ball back across the net.

4,372,562

INFLATABLE PACKER WITH LIQUID RESIN ANCHORED REINFORCING SHEATH

Ernest E. Carter, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 9, 1981, Ser. No. 300,507
Int. Cl.³ F16J *15/46*; E21B *33/12*
U.S. Cl. 277—34 **12 Claims**



1. An inflatable packer element, comprising:

an inflatable bladder means including a reinforcing element;

an end shoe including an annular anchor means, said anchor means including a roughened cylindrical inner surface concentrically disposed about an end portion of said reinforcing element and including a radially inward projecting annular shoulder located longitudinally inward of said roughened cylindrical inner surface;

a hardened ring formed from a liquid adhesive, said ring having said end portion of said reinforcing element embedded therein, said ring having a radially outer surface conforming to and bonded to said roughened cylindrical inner surface of said anchor means, and said ring having a longitudinally inner end engaging said shoulder of said anchor means, so that when a tension load is placed on said reinforcing element a portion of said load is transferred by said ring in compression against said shoulder of said anchor means and;

wherein a radially inner cylindrical surface of said hardened ring is free from any load bearing attachment to said end shoe, so that substantially all of said tension load on said reinforcing element is transferred by said hardened ring to said roughened cylindrical inner surface and said shoulder of said anchor means.

4,372,563

PACKING SUPPORT FOR MOUNTING A WELL CASING PACKING

Robert J. Diehl, Wallis, Tex.; William L. Godare, Rohnert Park, Calif., and Frederic D. Wells, Shreveport, La., assignors to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Oct. 26, 1981, Ser. No. 315,275
Int. Cl.³ F16J *15/06*; E21B *33/12*
U.S. Cl. 277—117 **5 Claims**

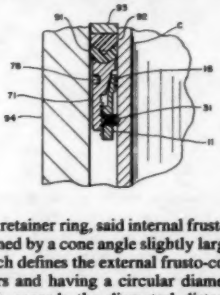
1. A support ring device adapted to be mounted in sleeved relationship to a casing or mandrel, said support ring device comprising:

an anchor ring member of a general cylindrical configuration and having an externally threaded wide diameter portion and with a plurality of threaded bores located circumferentially about said anchoring ring member and extending radially therein from the external surface of said

anchor ring member to the interior thereof, said radial bores adapted to receive set screws therein which may be used to secure said anchor ring member to said casing;

a plurality of upwardly extending fingers on the upper end of said anchor ring member which are disposed circumferentially about the ring member, each of said fingers being provided with gripping means on a portion of its inner surface and an external surface which is of frusto-conical configuration convergent toward the upper end of said anchor ring member and extending to the end of each said finger, said external frusto-conical surfaces having a common conical axis;

a retainer ring member having a central axial bore with internal threads in the lower end portion of said bore whereby said retainer ring member is adapted for threading engagement with the externally threaded surface of said anchor ring member, said retainer ring having an upper bore portion defined by an internal frusto-conical surface which is convergent inwardly toward the upper



end of the retainer ring, said internal frusto-conical surface being defined by a cone angle slightly larger than the cone angle which defines the external frusto-conical surfaces of said fingers and having a circular diameter at its widest end which exceeds the diametral distance between the frusto-conical surfaces on the exteriors of the finger tips whereby said fingers are receivable within the conical bore section of the retainer ring member as defined by said fruso-conical surface and said internal frusto-conical bore surface is adapted to engage said external frusto-conical surfaces of the fingers as the retainer ring member is threaded onto said anchor ring, said internal frusto-conical bore surface acting to wedge said fingers inwardly as said retainer member is threaded onto said anchor ring whereby said fingers are movable into gripping engagement with a casing disposed within said ring support device, and such support ring device having an annular upwardly facing surface provided by the upper end of said retainer ring member for supporting an apparatus on said casing.

4,372,564

GASKETS FOR CYLINDER HEADS

Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, County Durham, England

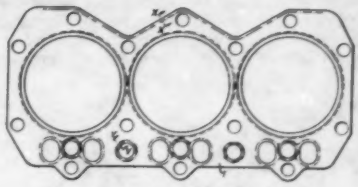
Filed Apr. 22, 1982, Ser. No. 370,923

Claims priority, application United Kingdom, May 1, 1981, 8113496

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—235 B **3 Claims**

1. A gasket for sealing the joint between the cylinder block and the cylinder head of a wet liner internal combustion engine comprising a pair of outer metal plates having outwardly directed corrugations formed therein away from cylinder bore openings and a composite metal spacer plate disposed between the two outer plates, the metal spacer plate comprising a central soft metal layer and hard metal surface layers and having around each cylinder bore opening and between the outer metal plates a metal washer formed on each axial face with circumferential serrations of V-shaped profile, the thickness of the washer measured over the peaks of the corrugations being somewhat greater than that of the spacer plate whereas the thickness measured between the troughs of the serrations is significantly less than that of the spacer plate, the said outer and central metal plates having their edges spaced away from the individual cylinder bore openings whereas the serrated



washer extends to the edge of those openings and has only its radially outer part accommodated between the two outer metal plates.

4,372,565

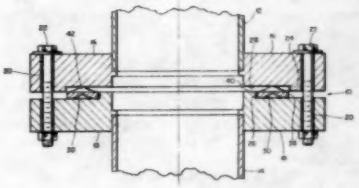
SOFT METAL SEAL

Neil C. Lien, Evansville, Wis., assignor to Baker Manufacturing Company, Evansville, Wis.

Filed Mar. 17, 1981, Ser. No. 244,606

Int. Cl.³ B21D *39/00*; F16L *23/00*

U.S. Cl. 277—236 **8 Claims**



1. A high pressure seal for sealing between first and second vacuum system elements comprising:

an annular deformable metallic sealing member which has a central ridge formed in it in its undeformed condition and which is held pressed between the elements in a flattened condition, the sealing member being deformed in its flattened condition to substantially conform to the shape of the cavity between the elements and to substantially fill the cavity, the sealing member having a pair of faces and inner and outer sealing edges,

a sealing shoulder formed on each of the elements arranged so as to abut and seal against a respective one of the sealing edges on the sealing member, and

one of the group composed of the sealing member and the two elements having at least one channel formed therein to allow any fluid confined by the ridge in the sealing member between the sealing member and a one of the elements to be drawn into the interior of the elements to avoid the possibility of later outgassing from the confined fluid.

4,372,566

MOLDED BASE PLATE FOR ROLLERSKATES ATTACHABLE TO SHOES

Richard D. Smith, 28640 Vista Madera, San Pedro, Calif. 90732

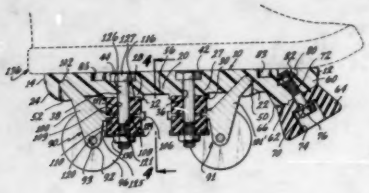
Continuation of Ser. No. 140,131, Apr. 14, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,362

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.19 **2 Claims**

1. As an article of manufacture in combination, a base plate

or chassis plate for carrying roller skate wheels and constructed for securement of a shoe to the base plate, wheel carrying chassis frames secured to the chassis plate, the chassis plate having a generally flat upper surface, the chassis plate having vertical bores normal to said surface spaced from each other, securing members for securing said wheel carrying chassis frames to the plate, said bores having counterbores at their upper ends for receiving said securing members, the said member having parts flush with the upper surface of the plate,



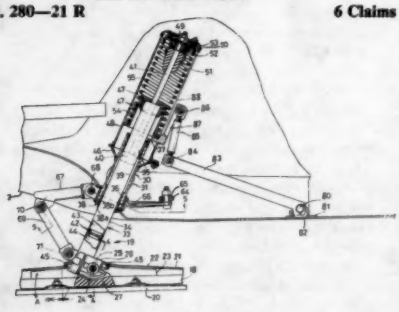
there being a single bore for securement of each chassis frame, the chassis frames having angularly extending brace members which extend outwardly at an inclined angle from the wheel axes; downwardly facing recesses formed in the chassis plate configurated to receive the ends of the brace members, said recesses having a longitudinally elongated opening on the lower surface of the chassis plate and having internal surfaces therein for ends of the brace members to abut against, said surfaces having a shape whereby a core member in a mold can be removed relatively in a direction normal to the base plate.

4,372,567

ANTI-ROLLING SYSTEM FOR SNOWMOBILE OF SMALL SIZE

Toshihiro Yasui, and Wayne L. Warnke, both of Coon Rapids, Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 17, 1980, Ser. No. 216,645
Int. Cl.³ B62B *17/04*
U.S. Cl. 280—21 R **6 Claims**



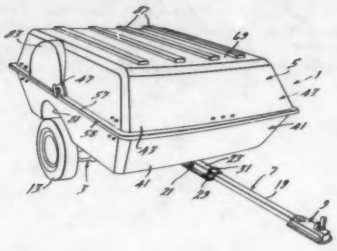
1. A suspension system for the steering skis of a snowmobile or the like comprising suspension means for suspending each of the skis for movement in a generally vertical direction relative to the body of the snowmobile, means for supporting each of the skis for steering movement about a respective steering axis, said suspension means including a pair of elements each associated with a respective of the skis, each of said elements being movable vertically with the respective ski during suspension movement and fixed against rotation about the respective ski steering axis for steering movement of the respective ski without corresponding rotation of the element about the steering axis, a torsion bar carried by the snowmobile and extending transversely across the body of said snowmobile, and means for torsionally loading the torsion bar upon movement of the respective suspension elements relative to each other upon vertical suspension movement of the skis without effecting loading of the torsion bar upon steering rotation of the ski including means for providing a pivotal connection between each of said elements and said torsion bar.

4,372,568

LUGGAGE AND ACCESSORY TRAILER

James H. Campbell, Bloomfield Hills, Mich., assignor to Spare Trunk Corporation, Southfield, Mich.

Filed Oct. 20, 1980, Ser. No. 198,310
Int. Cl.³ B62D *63/06*; B60D *1/06*
U.S. Cl. 280—63 **10 Claims**



1. A small, light-weight, utility trailer for use with a small automobile to carry luggage and accessories and the like which are ordinarily carried in the trunk of an automobile comprising a closed container type trailer body having upper and lower clam shell type sections sized to substantially fit within the silhouette of said small automobile, means for removable securing the upper clam shell section to the lower clam shell section so that it can be easily detached from the lower section, a chassis including a frame and a pair of wheels resiliently mounted on the frame, means securing the lower clam shell section to the frame, said chassis including a tongue for removable attachment to the rear of a small automobile, said tongue having separate front and rear sections, means for selectively connecting the front and rear tongue sections together in alignment for operative attachment to the rear of an automobile and for movement of the front section relative to the rear section to reduce the overall length of the tongue when it is desired to store the trailer, means for supporting the lower clam shell section and the chassis in a vertical position with the tongue extending vertically upward when it is desired to store the trailer said upper clam shell section being wider on the inside than the external width of the chassis across the wheels whereby for trailer storage it can be nested over the underside of the chassis and wheels when the chassis and lower section are in said vertical position, and bracket means attachable to said tongue for removably attaching the upper clam shell section in said vertical position to the chassis and lower clam shell section.

4,372,569

SINGLE WHEEL TRAILER SUPPORT

Robert C. Otterson, 11185 S.W. Foothill Dr., Portland, Oreg. 97225

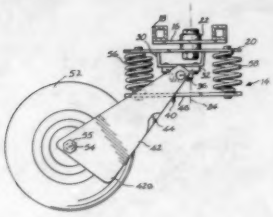
Filed Aug. 8, 1980, Ser. No. 176,465
Int. Cl.³ B62D *61/00*
U.S. Cl. 280—78 **5 Claims**

1. Single wheel apparatus for supporting a vehicle-towed trailer, said apparatus comprising:

an elongate substantially horizontal swivel member and swivel means for mounting the swivel member on the trailer for swiveling of the member about an upright axis,

an elongate arm assembly and pivot means mounting the assembly adjacent its upper end on said swivel member, at

a region intermediate the ends of the swivel member, for swinging of the arm assembly about a horizontal swing axis, the assembly including at least one elongate arm depending downwardly from said pivot means, said arm assembly further including an elongate spring-mounting member disposed under and spaced from the swivel member and joined to said arm between its ends, said swivel and spring-mounting members extending longitudinally in the trailer and having opposite end regions disposed forwardly and rearwardly of said swing axis,



a wheel mounted on said assembly adjacent the lower end thereof for rotation about a rotation axis substantially paralleling said swing axis and disposed rearwardly of said swivel axis,

compression spring means interposed between said swivel member and said spring-mounting member, located rearwardly of said swing axis, operable to urge said assembly in one direction about said swing axis, and

tension spring means interposed between said swivel member and said spring-mounting member, located forwardly of said swing axis, operable to urge said assembly in said one direction about said swing axis.

4,372,570

SPRAY-INHIBITING MEANS FOR USE ON A ROAD VEHICLE

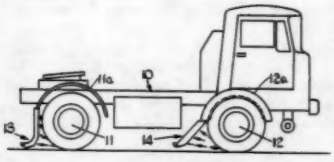
Maurice Goodall, Burton-on-Trent, England, assignor to Maurice Goodall (Holdings) Limited, Staffordshire, England

Filed May 19, 1980, Ser. No. 151,207

Claims priority, application United Kingdom, May 23, 1979, 7917900; Aug. 11, 1979, 7928041

Int. Cl.³ B62B *9/16*

U.S. Cl. 280—154.5 R **4 Claims**



1. A spray-inhibiting attachment for mounting behind the wheel of a vehicle, said attachment comprising:

(a) a downwardly extending hollow housing having a forwardly disposed portion and with the latter forming an inlet opening for receiving therethrough water and the like thrown rearwardly from the vehicle wheel,

(b) said housing also having a rearwardly disposed wall portion spaced from and generally parallel to said forwardly disposed portion and with said portions being joined by side members to form a chamber for downward passage of water therein,

(c) said forwardly disposed portion merging at its lower end into a bottom wall member which is adapted to be positioned closely adjacent the road surface,

(d) the lower portion of said rearwardly disposed wall portion and said side members forming, together with said bottom wall member, a generally horizontal rearwardly facing water discharge orifice of substantially lesser cross-sectional area than said inlet opening so that water discharging horizontally rearwardly through said orifice from said chamber moves horizontally forwardly, relative to the road surface, at a velocity less than that of the moving vehicle to thereby reduce spray formed by the discharged water as it engages the road surface,

(e) said attachment also incorporating an upper portion which is disposed above said hollow housing so as to communicate with the interior thereof and which has water-intercepting means arranged to intercept and collect water which in use is thrown against said upper portion by the vehicle wheel so as to direct such water downwardly into the said chamber,

(f) said water intercepting means of said upper portion comprising a plurality of spaced parallel baffles which provide between them a plurality of connected passages forming a generally wave-like sinuous configuration in cross-section.

4,372,571

TRACTOR AND TRAILER COMBINATION

Warren S. Lister, 13 Woodmancourt, Godalming, Surrey, GU7 2BT, England

Filed Jul. 28, 1980, Ser. No. 172,654

Claims priority, application United Kingdom, Aug. 8, 1979, 7927569; Mar. 24, 1980, 8009887

Int. Cl.³ B60D *1/14*; B62D *53/06*

U.S. Cl. 280—423 A **6 Claims**

1. A tractor and trailer combination comprising a drawbar tractor incapable of supporting substantial vertical loads, a semi-trailer having a forward end devoid of ground engaging wheels, and a connector coupling the forward end of said trailer to said tractor, said connector including a frame, an arm, a pivot connecting said arm to said frame and defining a single point of articulation between said tractor and said trailer, a trailer engaging member, means mounting said member on said arm for vertical reciprocation, and means for raising and lowering said member on said arm, means securing the frame to the tractor for towing the connector, and ground engaging wheel means arranged to support vertical loads imposed on said raising and lowering means by the trailer whereby no vertical load is transmitted to said tractor from the trailer.

4,372,572

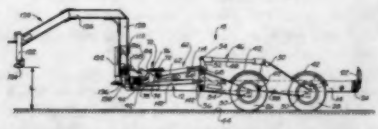
LIFT BED TANDEM AXLE TRAILER

Richard Verschage, Kewanee, Ill., assignor to The Advance Metalworking Co., Kewanee, Ill.

Filed Mar. 16, 1981, Ser. No. 243,783

Int. Cl.³ B60P *1/02*; B62D *21/02*

U.S. Cl. 280—423 B **11 Claims**



1. A lift bed, tandem axle, trailer, comprising:

a bed having a load supporting floor structure with opposite sides and front and rear ends;

a pair of wheel support arms mounted for pivotal movement about a pair of longitudinally spaced apart transverse axes on each side of said bed for raising and lowering the bed with respect to the ground;

an axle and wheel mounted at the outer end of each support arm for rolling support of said bed;

a tongue extending forwardly of the front end of said bed having an outer end adapted to be hitched to a pulling vehicle for towing said trailer;

load equalizing linkage means between each pair of said wheel support arms on each side of said bed comprising a first link pivotally connected at one end to the rear support arm eccentric of the mounting axis thereof and a second link pivotally interconnected to an opposite end of said first link and pivotally connected to the front support arm eccentric of the mounting axis thereof;

lift means on each side of said bed for pivoting said support arms to raise and lower said bed, said lift means including a longitudinally extensible thrust member having one end pivotally connected to said second link at a point between the pivotal connections of said first link and said front support arm therewith, said thrust member having an opposite end interconnected with said bed; and

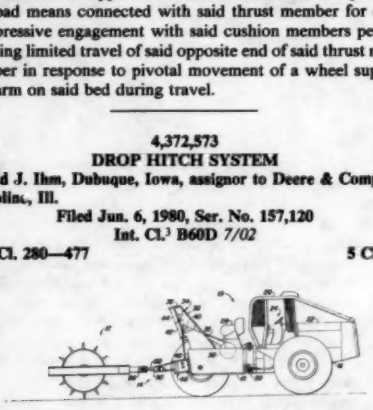
shock absorber means for interconnecting the opposite ends of said thrust member and said bed permitting limited travel of said ends in opposite directions longitudinally of said thrust member, said shock absorber means including a bracket fixed to said bed and a pair of resilient cushion members on opposite faces of said bracket, and pressure pad means connected with said thrust member for compressive engagement with said cushion members permitting limited travel of said opposite end of said thrust member in response to pivotal movement of a wheel support arm on said bed during travel.

4,372,573

DROP HITCH SYSTEM

Gerald J. Ihm, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 6, 1980, Ser. No. 157,120
Int. Cl.³ B60D *7/02*
U.S. Cl. 280—477 **5 Claims**



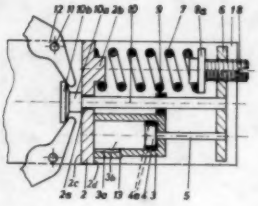
1. In combination with a log skidder including a main frame having a cable winch mounted thereon and wrapped with a length of cable, a drop hitch system, comprising: a drop hitch frame releasably secured to the rear of the skidder and including top, bottom and opposite side walls joined together to define a hollow enclosure opening towards the rear; a horizontal roller extending between and being rotatably supported by the opposite side walls; said top wall having an opening therein forwardly of the horizontal roller for receiving the cable, a pair of upright cable guide means mounted between the top and bottom walls and forming respective rear portions of the opposite side walls; a pulley block having side plates disposed on opposite sides of and rotatably supporting a cable pulley; said plates defining a clevis connection; said cable extending through the opening in the top wall, beneath the roller, about the cable pulley and having a free end anchored to the drop hitch frame at a location spaced equidistant from the upright cable guide means.

4,372,574

SAFETY SKI BINDING

Josef Svoboda, Schwechat, and Franz K. Edinger, Vienna, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 34,193, Apr. 27, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,038
Claims priority, application Austria, Apr. 27, 1978, 3025/78
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—634 **26 Claims**



1. A safety ski binding which releases upon reaching a predetermined threshold a ski boot therefrom, comprising:

a base plate adapted to be secured to a ski;

a sole holder movably mounted on said base plate and adapted to engage said ski boot, said sole holder being movable between a ski boot holding position and a ski boot releasing position;

resilient means operatively connected to and biasing said sole holder toward said ski boot holding position and resisting movement of said sole holder toward said ski boot releasing position;

dashpot means independent of said resilient means and operatively connected to said sole holder means and said resilient means for further resisting the movement of said sole holder means from said ski boot holding position toward said ski boot releasing position, said dashpot means including first means defining a chamber and a member movable in said chamber and dividing said chamber into two parts, a fluid in said chamber, connecting means for connecting said sole holder means to one of said chamber defining first means and said movable member so that said movable member is moved relative to said chamber in response to a movement of said sole holder means, restricted passageway means extending through said movable member to provide a restricted fluid connection between said two parts of said chamber and to facilitate a transfer of said fluid from one part of said chamber to the other part thereof; and

second means responsive to the position of said movable member in said chamber for suddenly reducing the resistance to movement of said movable member relative to said chamber and, consequently, the movement of said sole holder means to thereby facilitate the fast release of said ski boot from said ski binding.

4,372,575

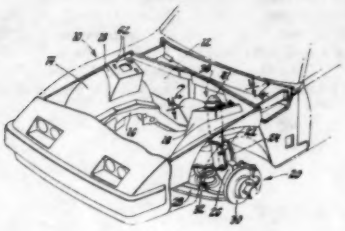
VEHICLE STRUT TYPE SUSPENSION WITH ALIGNMENT ADJUSTMENT

Marvin J. Hyma, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1981, Ser. No. 232,833
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **1 Claim**

1. In a vehicle wheel spring suspension including a strut member on a generally vertical axis of the vehicle and connected adjacent its lower end with wheel spindle means and with a link member swingably mounted on the sprung vehicle superstructure, upper end mounting apparatus for said strut member, comprising, a thin sheet metal superstructure panel including a generally flat mounting tower portion above the

strut proper oriented in a plane substantially orthogonal with said strut axis, an upper strut mounting plate assembly lying against the upper side of said tower portion and including an isolation element on said axis which receives the upper end of said strut, said plate assembly having defined therein a set of slots on parallel axes and widely spaced about said axis, a stud retainer and tower reinforcing member lying against the underside of said tower portion and of a breadth to lie opposed to said set of slots of said plate assembly, said tower portion



having therein a set of slots juxtaposed to said set of plate assembly slots and arranged on axes perpendicular to the axes thereof, said stud retainer and reinforcing member having affixed thereto a set of threaded studs projecting through the juxtaposed said sets of slots, and nuts threaded over said studs whereby to clamp the tower portion in reinforcing engagement between said plate assembly and said member and whereby either strut camber or strut caster or both may be adjusted by loosening of said nuts for movement of said plate assembly relative to said mounting tower portion.

4,372,576

HOLLOW STABILIZER FOR VEHICLE

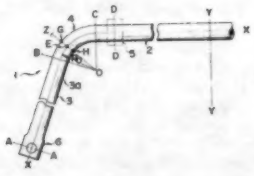
Kanji Inoue, Yokohama, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 3, 1980, Ser. No. 212,500

Claims priority, application Japan, Dec. 22, 1979, 54-167282

Int. Cl.³ B60G *19/00*

U.S. Cl. 280—689 **5 Claims**



1. A hollow stabilizer for a vehicle, made of a welded metal pipe having a longitudinal welded seam, comprising:

a torsion section to be coupled to a chassis;

a pair of arm sections to be coupled to a wheel suspension; and

a pair of curved sections each connecting the torsion section and the corresponding arm section, the seam of each curved section being so positioned that it extends along the largest curvature portion of all of the curved portions of the curved sections thereof such that the principal stress generated during operation of the stabilizer is small, said position being further determined by the ratio of the wall thickness of the pipe to the outer diameter thereof and by the ratio of the radius of curvature of the curved section to the outer diameter thereof.

4,372,577

TRACTOR

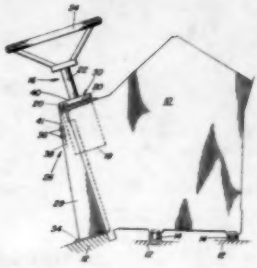
Henning Adickes, Heidelberg, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 30, 1980, Ser. No. 164,800

Claims priority, application United Kingdom, Jul. 27, 1979, 7926193

Int. Cl.³ B62D *1/16, 1/18*

U.S. Cl. 280—780 **2 Claims**



1. A tractor steering assembly comprising:

a support housing;

a steering valve fixed to the support housing;

a generally L-shaped bracket having a first downwardly extending leg and a second leg having a downwardly extending lip circumscribing a downwardly opening trough and having a bracket aperture extending therethrough;

adjustable means for attaching the first leg to the support housing and for permitting alignment of the bracket;

a damping member positioned between the second leg and the support housing and received by the trough, the damping member having a thickness which is greater than the length of the lip of the second bracket leg and having a damping bore with a diameter which is smaller than the diameter of the bracket aperture; and

a steering column coupled to the steering valve and extending through the bore in the damping member and through the bracket aperture, the damping member resiliently resisting relative movement between the bracket and the steering column and yielding to permit engagement between the steering column and a peripheral surface of the bracket aperture upon predetermined compression of the damping member, the damping member damping vibrations of the steering column under low loads, and the peripheral surface of the bracket aperture engaging the steering column to limit deflection of the steering column under high loads.

4,372,578

PASSIVE SAFETY BELT DEVICE

Junichi Takizawa, Isesaki; Seiichiro Kojima, Ohramachi; Nobuo Satoh, and Eiji Nakazato, both of Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,179

Claims priority, application Japan, Jul. 17, 1979, 54-98657[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **9 Claims**

1. A passive safety belt device for a vehicle having a sashless door, comprising

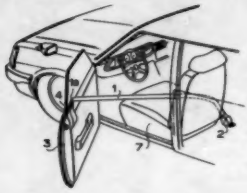
a retractor being disposed in a lower portion of a central portion of the vehicle,

a belt supporting member upwardly extending a predetermined height from a rear portion of the sash-less door,

a safety belt being connected between said retractor and said belt supporting member,

a spring steel plate enclosed by said safety belt at an outer end portion of the latter and secured to said belt supporting member at an end thereof,

said belt supporting member being a hollow body comprising a superimposed pair of plates,



bolts rigidly securing said hollow body to an inside panel of said door at said rear portion, and

said spring steel plate and said superimposed pair of plates being secured to each other.

4,372,579

PASSIVE SEAT BELT ARRANGEMENT FOR A VEHICLE

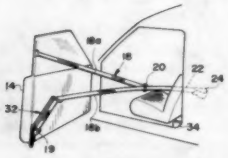
Hideoki Matsuoka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 14, 1980, Ser. No. 206,988

Claims priority, application Japan, Nov. 19, 1979, 54-166191[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **5 Claims**



1. A passive seat belt arrangement for a vehicle having a door hinged to the body of said vehicle, comprising:

a first belt having one end fixed to an upper rear portion of said door and the other end fixed to a lower rear portion of said door;

a second belt having at its one end a through ring through which said first belt passes so as to divide the first belt into a shoulder restraining section and a lap restraining section;

a belt retractor mounted in said vehicle to retract said second belt;

a belt supporting member constructed of a resilient wire and connected to an inner side of said door, said belt supporting member including a base portion fixed to said inner side of the door, a fulcrum portion extending from said base portion, a hair-pin portion extending downward and inward from said fulcrum portion to form a hair-pin construction with a curved lower portion, a straight portion extending upwardly from said hair-pin portion while making an obtuse angle relative to said hair-pin portion, and a belt supporting portion extending from said straight portion for supporting thereon a portion of said lap restraining section, the connection of said belt supporting member to said door being such that when no external force is applied to the belt supporting member, the hair-pin portion is raised by a certain angle from the inner side of said door permitting said straight portion to lie on the inner side of said door by making said fulcrum portion act as a fulcrum; and

a blocking member mounted to said vehicle at a portion with which said curved, lower portion of said hair-pin portion is engageable upon closing of the door.

4,372,580

AUTOMATIC SEATBELT SYSTEM

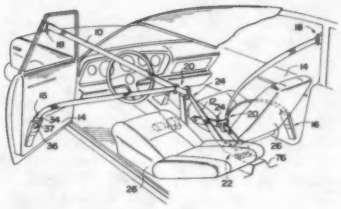
Masanao Motonami, Toyota; Hisashi Ogawa, Okazaki, and Yoshikazu Imai, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 221,366

Claims priority, application Japan, Feb. 18, 1980, 55-19480[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **9 Claims**



1. An automatic seatbelt system, wherein said seatbelt system has an outer webbing and an inner webbing and said webbings are automatically fastened to an occupant upon his entering a vehicle, comprising:

(a) a first anchor portion secured to the lower portion of a vehicle door, erected upwardly in the vehicle and provided at the forward end thereof with a buckle device;

(b) a tongue plate secured to one end of said outer webbing and engageable with said buckle device;

(c) a second anchor portion for engaging the other end of said outer webbing with the upper portion of the door, said second anchor portion comprising:

a mounting block fixed to a window frame, engaged with a striker having an engageable piece with slot-like cuts penetrated therethrough, said striker being secured to the vehicle body;

an anchor plate solidly secured to said mounting block and engagable with said outer webbing;

anchor bolts, having enlarged first end portions, projecting from said mounting block and inserted through said slot-like cuts, said enlarged first end portions being inserted at the side of said engagable piece opposite to said mounting block so that said enlarged first end portions can be engaged with said engagable piece to impart tensions of the webbings to the vehicle body;

(d) a through-ring for engagement with the forward end of said inner webbing to movably guide the intermediate portion of said outer webbing in the longitudinal direction thereof and to prevent said outer webbing from moving in an emergency of the vehicle;

(e) a retractor provided at substantially the central portion of the vehicle and adapted to wind up the base portion of the inner webbing by a biasing force, and to directly lock the intermediate portion of the inner webbing to prevent the inner webbing from being wound out in an emergency of the vehicle; and

(f) a guide device for moving the intermediate portion of said inner webbing forward in the vehicle to enlarge a space for the occupant to enter or leave the vehicle when the occupant enters or leaves the vehicle.

4,372,581

PRESSURE SENSITIVE COPYING MATERIAL

Hermann Schumacher, Ulmenweg 2, Wülfrath; Tilman Molineus, Langendorfer Str. 7, Dornap-Düssel, and Detlef Ridder, Rellinghauser Str. 153, Essen, all of Fed. Rep. of Germany

Continuation of Ser. No. 31,834, Apr. 20, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,432

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817557

Int. Cl.³ B41M 5/16, 5/22

U.S. Cl. 282—27.5 10 Claims

1. A pressure sensitive copying element comprising a web having on one side thereof a colour forming coating comprising a layer of a single continuous phase mixture of alkanes having molecular weights from 500 to 3500 with from 0.1 to 10% by weight, based on the weight of said coating, a material selected from the group consisting of cellulose derivatives, hydrocarbon resins, melamine resins, phenolic resins, and styrene resins, and a solution of a colour former in a liquid solvent therefor, said material and said solution each being a separate phase and being dispersed directly in said single phase continuous mixture of alkanes.

4,372,582

STABILIZER FOR ELECTRON DONER-ACCEPTOR CARBONLESS COPYING SYSTEMS

Thomas C. Geisler, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 30, 1981, Ser. No. 248,843

Int. Cl.³ B41M 5/14, 5/16, 5/22; C09D 11/00

U.S. Cl. 282—27.5 15 Claims

13. A system for forming stable, fade-resistant colored markings from a substantially colorless color-forming composition and a substantially colorless color-developing composition comprising:

(a) a carrier means carrying said color-forming composition, said color-forming composition comprising at least one leuco dye which is fadeable or discolorable after development, carried in an organic solvent vehicle;

(b) a record sheet having on at least a portion of one major surface said color-developing composition comprising an acidic coreactant material capable of reacting with said color-forming composition to provide colored products;

(c) a stabilizing agent carried in a composition selected from the group consisting of said color-forming composition and said color-developing composition, said stabilizing agent being 2,2'-methylene-bis-(4-methyl-6-t-butyl phenol); and

(d) transfer means for transferring at least a portion of said color-forming composition to selected areas of said record sheet having said color-developing composition thereon.

4,372,583

CHROMOGENIC COPY SYSTEM AND METHOD

Anthony E. Vassiliades, 8738 Tanager Woods Dr., Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 173,255, Jul. 29, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,602

Int. Cl.³ B41L 1/20; B32B 5/16, 27/42

U.S. Cl. 282—27.5 17 Claims

1. A pressure-sensitive chromogenic copy system comprising a transfer sheet having on at least a portion of at least one surface thereof a color developer capable of reacting with a chromogen to form a color image, said color developer comprising an oligomeric aromatic carboxylic acid or metallic salt thereof and said oligomer is formed by reacting an aromatic carboxylic acid with an aldehyde at a pH above 7.

10. A coated front and back sheet for a pressure-sensitive chromogenic copy system comprising a substrate having on at least a portion of one surface thereof a coating of chromogen-containing microcapsules and on at least a portion of the other surface thereof a coating of a color developer capable of reacting with said chromogen to form color images, said color developer comprising an oligomeric aromatic carboxylic acid or metallic salt thereof and said oligomer is formed by reacting an aromatic carboxylic acid with an aldehyde at a pH above 7.

4,372,584

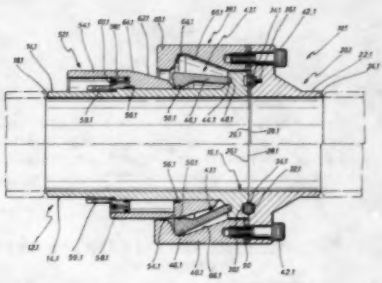
COUPLING FOR COUPLING TUBULAR ELEMENTS

Jack E. Miller, Houston, Tex., assignor to Big Inch Marine Systems, Inc., Houston, Tex.

Filed Sep. 26, 1979, Ser. No. 79,218

Int. Cl.³ F16L 35/00

U.S. Cl. 285—18 21 Claims



1. A coupling for coupling two tubular elements, the coupling comprising:

first and second tubular members in the form of complementary male and female members for mating with each other, the members having engagement surfaces to be engaged with each other when the members are engaged to limit relative axial movement in one direction,

a locking member axially located by locating means on the first member, the locking member comprising an annular locking sleeve having a plurality of circumferentially spaced displaceable locking fingers which are integral with and comprise a continuous extension of the material of the locking sleeve, and which extend generally axially from the locking sleeve,

displacement means associated with one of the members for displacing the free end portions of the locking fingers transversely to the axis of the locking sleeve, and

a locking recess in the second member for receiving the locking fingers when displaced by the displacement means while the members are in mating engagement, the locking recess defining a bearing surface along which the free ends of the locking fingers will move and against which the free ends of the locking fingers will bear during displacement, the bearing surface being inclined to the axis of the coupling for the locking fingers to be axially compressed between the bearing surface and the locating means and thus to draw the engagement surfaces of the two members into engagement with each other when the free ends of the locking fingers are displaced along the bearing surface.

4,372,585

SLEEVE PROTECTOR FOR VENTING PIPES

Victor Evora, 2209 NW. 5th St., Miami, Fla. 33125

Filed Feb. 2, 1981, Ser. No. 231,216

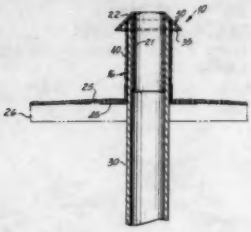
Int. Cl.³ E04D 13/14

U.S. Cl. 285—43 2 Claims

1. A sleeve protector for venting pipes with circular cross-section and protruding through the roof of a building comprising, in operative combination:

(a) a tubular member including a hollow cylinder attached to a flanged flat portion on one end and said cylinder being provided with a plurality of circumferential ribs on its outer wall, and said tubular member adapted to receive said protuding venting pipes, and

(b) a cap member including a second hollow cylinder and a headed termination attached to one end of said second cylinder having substantialy the shape of a truncated cone



with the larger base of said cone being provided with a plurality of inwardly extending clamps in interlocking cooperation with said ribs so that said cap member can be driven in and locked permanently in position.

4,372,586

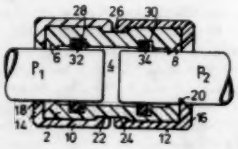
ROD CLAMP PARTICULARLY USEFUL AS PIPE COUPLING

Peretz Rosenberg, and Avner Rosenberg, both of Moshav Beit Shearim, Israel

Filed Sep. 25, 1980, Ser. No. 190,653

Int. Cl.³ F16L *21/02*

U.S. Cl. 285—178 **15 Claims**



1. A rod clamping device particularly useful as a pipe coupling characterized in that it includes: at least two coaxial members formed with aligned bores adapted to receive therethrough a pipe to be coupled; each of said members being further formed with an annular shoulder projecting inwardly of its respective bore and adapted to grip the pipe when inserted therein; at least one of said annular shoulders being eccentric to the axis of its respective member such that one of said members may be rotated relative to the other either to a release position wherein said annular shoulders are substantially aligned throughout their circumferences thereby permitting the pipe to be freely inserted and removed from their respective bores, or to a clamping position wherein due to the eccentricity of said at least one annular shoulder, the pipe is securely gripped between the shoulders of the two members; said annular shoulders including hard, sharp edges which bite into the pipe when the members are in their clamping positions.

4,372,587

ADAPTER FLANGE

Charles W. Roche, Northboro, Mass., assignor to Uni-Flange Corporation, Northboro, Mass.

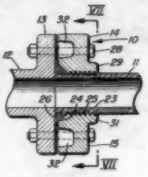
Continuation of Ser. No. 97,352, Nov. 26, 1979, abandoned. This application Apr. 14, 1981, Ser. No. 263,710

Int. Cl.³ F16L *47/00*

U.S. Cl. 285—238 **2 Claims**

1. Adapter flange for attaching a plastic pipe to a member having a flange, comprising:

(a) two similar main bodies of semi-circular shape, having laterally-extending arms adapted to be fastened together, the bodies defining between them a central bore having a diameter substantially equal to the diameter of the pipe, a conical counterbore at one of said central bore, and a plurality of axial peripheral bores to receive bolts fastening them to the said flange of the member, the surface of the central bore being formed with a plurality of annular serrations, the cross-section of each serration having a triangular shape formed by two sides which are oblique to the surface of the pipe and which intersect to form a shape edge for piercing the surface of the pipe, the two sides being on opposite sides of a plane which is perpendicular to the surface of the pipe and which extends through said sharp edge, each serration having a height relative to the outer diameter of the pipe such that, when the main bodies



are fastened together, the serrations penetrate the pipe an amount sufficient to prevent slippage of the main bodies on the pipe, but not sufficient to damage or weaken the pipe, each of said main bodies being generally defined by two spaced, parallel faces and a cylindrical surface of semi-circular cross-section, each of said main bodies being provided with pockets that open onto one of the faces and are located between the said peripheral bores,

(b) a resilient seal adapted to extend into said counterbore and to be compressed between the surface of the main bodies and the flange of the member, and

(c) a protuberance on each of said bodies that form an axially-extending hub.

4,372,588

KNOTTER BILLHOOK

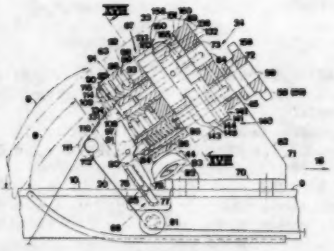
Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jun. 15, 1981, Ser. No. 274,033

Claims priority, application United Kingdom, Jul. 5, 1980, 8022112

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—8 **42 Claims**



1. A knotter apparatus comprising:

a twine holder operable to hold, during a knot tying operation, a primary and secondary portion of twine in which a knot is to be tied;

a first shaft rotatably supported on a frame, said twine holder mounted on said first shaft;

a plurality of spaced apart twine holder flanges mounted on said first shaft;

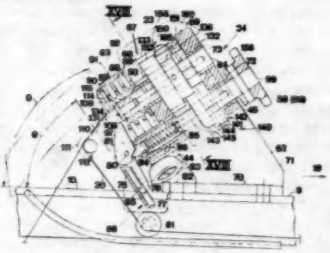
a plurality of twine holder fingers pivotally supported by said frame and resiliently urged relative to said flanges;
a second shaft rotatably supported on said frame;
a billhook angularly mounted on said second shaft and operable to tie a knot in said primary and secondary twine portions;
said first and second shafts extending substantially parallel to each other; and
drive means connected for permitting the second shaft to intermittently drive the first shaft during knot tying operations.

4,372,589

KNOTTER APPARATUS

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jun. 15, 1981, Ser. No. 273,781
Claims priority, application United Kingdom, Jul. 5, 1980, 8022112
Int. Cl.³ B65H *69/04*
U.S. Cl. 289—13 **14 Claims**



1. A knotter apparatus comprising:
a twine holder operable to hold, during a knot tying operation, a primary and a secondary portion of twine in which a knot is to be tied;
a first shaft rotatably supported on a frame, said twine holder mounted on said first shaft;
a plurality of spaced apart twine holder flanges mounted on said first shaft;
a plurality of twine holder fingers pivotally supported by said frame and resiliently urged relative to said flanges;
a second shaft rotatably supported on said frame;
a billhook mounted on said second shaft and operable to tie a knot in said primary and secondary twine portions; and
said first and second shafts extending substantially parallel to each other.

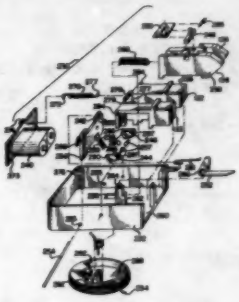
4,372,590

ELECTRONIC SECURITY DEVICE AND METHOD

Eugene R. Pilat, 2035 Audubon Dr., Glendale Heights, Ill. 60137; George J. Franks, Jr., 261 Whitehall Dr., Palatine, Ill. 60072, and Jerry F. Dyben, 541 Kirkmore Dr., New Haven, Ind. 46779

Continuation-in-part of Ser. No. 28,861, Apr. 10, 1979. This application Mar. 17, 1980, Ser. No. 130,597
Int. Cl.³ E05C *1/08*
U.S. Cl. 292—33 **10 Claims**

1. An electromechanical lock unit comprising, in combination, a lock housing unit, a striker unit and a dead bolt unit, each mounted for reciprocation in relation to said housing, said striker being movable between an extended and a retracted position and said bolt being movable between an extended position, a first fully withdrawn position and a sectond, less withdrawn position, dear bolt engagement means on said striker, said dead bolt engagement means being movable between an extended position in which said means forms an operative connection between said striker and said dead bolt, and a withdrawn position allowing movement of said striker to an extended position without corresponding movement of said dead bolt, resilient means normally urging said dead bolt engagement means toward said dead bolt, means associated with said dead bolt engagement means for moving said means to said withdrawn position, means normally urging said striker toward the extended position thereof, means normally urging said dead bolt to the withdrawn position thereof, means for manually positioning said dead bolt in said second position thereof so that said dead bolt engagement means may engage said dead bolt, said striker urging means having sufficient force



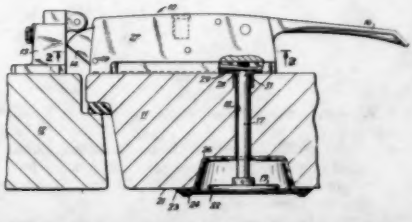
to push said dead bolt and said striker to said extended position thereof, a dead bolt locking latch, and mechanical latch-engaging means movable by a portion of said dead bolt between a first, locking latch-engaging position when said dead bolt is in said extended position thereof, and a second position out of engagement with said locking latch, said locking latch being operatively connected to said means for moving said dead bolt engagement means to said withdrawn position thereof, and means operable in response to an electrical control signal for withdrawing said locking latch from engagement with said latch-engaging means to permit said dead bolt to be withdrawn so as to open said lock.

4,372,591

SAFETY LATCH

Sanford L. Cook, Ocean; Justin J. Molisani, Bricktown, and Kenneth I. Denaison, Jr., West Allenhurst, all of N.J., assignors to Standard-Keil Hardware Mfg. Co., a Division of Buildex Inc., Allenwood, N.J.

Continuation of Ser. No. 973,264, Dec. 26, 1978, Pat. No. 4,203,622. This application Dec. 21, 1979, Ser. No. 106,318
The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.
Int. Cl.³ E05C *3/16*
U.S. Cl. 292—221 **8 Claims**



1. Inner safety release mechanisms for use in combination with a refrigerator door latch, said release mechanism comprising:

cup means for seating in a matching recess on the interior face of a refrigerator door, pushrod means traversing said door from the interior to the exterior thereof and having an exterior and an interior end, said exterior end being disposed for releasing said latch when said pushrod means is urged toward the exterior face of said door, said cup means having an aperture therein for passage therethrough of said pushrod means for actuating said latch, said cup means having an open face and a flange thereabout for seating against the inner face of said door; and

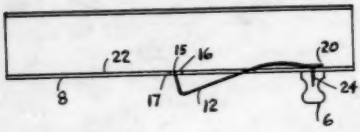
flexible vapor barrier means covering said open face for prevention of flow of water vapor therethrough.

4,372,592

LOCKING DEVICE

Miki E. Beese, R.R. #3, Goderich, Ontario, Canada (N7A 3X9)

Filed Dec. 24, 1980, Ser. No. 219,982
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—288 **4 Claims**



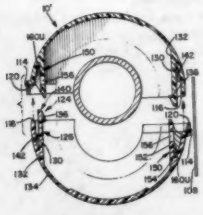
1. A locking device comprising a channel having a U-shaped cross section with a top portion and two side portions, with releasable locking means mounted on one of said side portions, said locking means being made of a strip of suitable metal and having two ends, one end of said strip being bent to form a bolt portion adjacent to an opening on said side portion, the other end of said strip extending within said channel through a second opening in said side portion with an end of the strip opposite to the bolt portion being mounted on an inner surface of said portion containing the openings, the strip being mounted under stress to force the bolt portion towards the opening to which it is adjacent.

4,372,593

TAMPER INDICATOR

David A. Kesselman, 16685 Arnold Dr., Sonoma, Calif. 95476

Filed Jun. 17, 1981, Ser. No. 274,483
Int. Cl.³ B65D *55/02*; F16B *41/00*
U.S. Cl. 292—307 B **24 Claims**



1. A means for indicating tampering with a connection nut comprising:

a circular collar for surrounding and accommodating the connection nut therewithin, said collar being formed of frangible material and including a pair of interlocked collar portions;

each of said collar portions being arcuate in circumferential shape to form a portion of a circle and including a first end having a first end edge and a second end having a second end edge with a first end edge of one collar portion abutting a second end edge of another collar portion to form an essentially continuous, closed periphery about the connection nut, each collar portion further including a first fastening means on said first end and a second fastening means on said second end, said first fastening means including a flexible elongate member affixed at one end thereof to an inner surface of said collar portion and having another end thereof being free and spaced inwardly of said collar portion inner surface, said elongate member having an inner face and an outer face located adjacent to said collar portion inner surface and interposed between said inner face and said collar portion inner surface, said free end being spaced from said collar portion first end to be located outside of said collar portion and having mating means thereon, said mating means including a first ramp angled with respect to said collar inner surface and a ledge forming leg connecting said ramp to said elongate member inner face, said leg being angled with respect to said ramp and to said elongate member inner face and intersecting said inner face at an acute angle with respect to said inner face to form a first catch, said second fastening means includng a flexible elongate member affixed at one end thereof to an inner surface of said collar portion and having another end thereof being free and spaced inwardly of said collar portion inner surface, said elongate member having an inner face and an outer face located adjacent to said collar portion inner surface and interposed between said inner face and said collar portion inner surface, said free end being spaced from said collar portion second end to be located outside of said collar portion and having mating means thereon, said mating means including a ramp defined in said second fastening means elongate member outer surface and angled with respect to said collar inner surface and a ledge forming leg, said leg being angled with respect to said ramp and to said elongate member outer face and intersecting said outer face at an acute angle with respect to said outer face to form a second catch, said first and second catches being mirror images of each other to mate with each other when said collar portions are interlocked, said ramps being angled and located to cause said elongate member to flex when a ramp on said first fastening means of one collar portion is in contact with a ramp on a second fastening means of another collar portion during interlocking of said collar portions, said fastening means being located completely within the periphery of said collar whereby access thereto from outside said collar is prevented;

a cuff surrounding said collar portion second end on at least three sides thereof, said cuff being L-shaped and having a first leg attached to an outer surface of said collar portion adjacent to said collar portion second end edge and extending outwardly from said outer surface, said cuff having a second leg attached to said first leg at a location spaced outwardly from said collar portion outer surface and extending forwardly of the end edge of said collar portion second end so that said cuff is raised from said collar portion outer surface, said inner connecting surfaces between said cuff and said collar portion defining said second end edge and being in the form of a shoulder means on each of said three sides which extend at substantially right angles to the inner and outer surface of said collar portion, and said first end edge of said collar portion defining a rim which also extends at substantially right angles to the inner and outer surfaces of said collar portion, a cuff on one collar portion extending over the first end of a second collar portion to cover said abutted first and second end edges with said shoulder means and said rim being juxtaposed;

at least one reinforcing rib attaching each elongate member to said collar inner surface at a location spaced from said member one end;

weakening means on each collar portion which make the

collar susceptible to breaking when removal from a connection nut is attempted; and

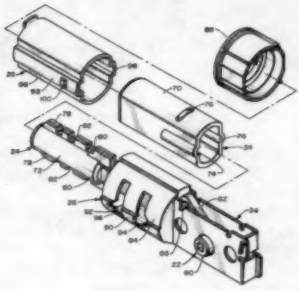
the elongate members of said first and second fastening means being positioned on said collar portions to bias said fastening means into locking engagement when said collar portions are interlocked.

4,372,594

BAYONET JOINT BACKSET ADJUSTMENT FOR LATCH CONSTRUCTIONS

Arnold C. Gater, Anaheim, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 19, 1980, Ser. No. 188,758
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—337 **9 Claims**



1. In a latch construction for mounting in doors and the like of the type having a bolt longitudinally reciprocal in a door-mounted stationary casing between a forward extended position projecting from a door edge and a rearward retracted position substantially fully within the door edge, latch operating means forwardly operably connected to said bolt and rearwardly operably connected to an operator thereof, said operating means operator being movable about a transverse axis actuating said operating means to reciprocate said bolt, the longitudinal distance between forward extremities of said casing and said operator axis constituting backset; the improvements comprising: casing projection and slot means operably connected to said casing selectively longitudinally adjustable a determined amount for increasing or decreasing said backset said determined amount; bolt projection and slot means operably connected to said bolt selectively longitudinally adjustable a same said determined amount for coordinating with said casing backset increasing or decreasing; each of said casing and bolt projection and slot means including a pair of longitudinally spaced transverse slot portions joined by a longitudinal slot portion.

4,372,595

AUTOMOBILE BUMPER

Gary P. Roberts, 4303 Hanover Ter., Marshall, Tex. 75670

Filed Apr. 10, 1981, Ser. No. 252,939
Int. Cl.³ B60R *19/02*
U.S. Cl. 293—131 **12 Claims**

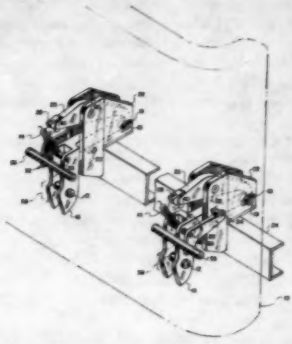
1. An automobile bumper assembly comprising:

a plurality of support brackets fixedly mountable on an automobile;

a plurality of generally L-shaped support arms, each of said support arms resiliently mounted at a first end thereof in each one of said support brackets;

an elongated bumper member pivotally mounted at a second end of each of said support arms, along a lower edge of said bumper member;

a plurality of impact absorbing members, each of said impact absorbing members mounted in each one of said support brackets and including a resilient portion positioned above said pivotal mounting of said bumper member; and



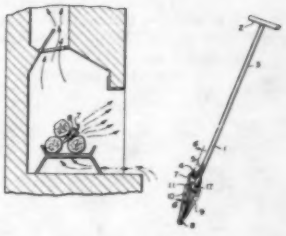
biasing means for pivoting said bumper member into contact with the resilient portion of said impact absorbing means.

4,372,596

FIREPLACE LOG SEPARATOR

Frank Sanders, 204 Springcreek Dr., Pineville, La. 71360

Filed Jan. 6, 1981, Ser. No. 223,021
Int. Cl.³ F23H *17/10*
U.S. Cl. 294—9 **9 Claims**



1. A system for separating combustable materials when said materials are positioned in a combusting situs comprising a substantially pyramidally shaped wedge, said wedge having a bore portion, said bore portion having an internally disposed chamber, a keyway communicating said chamber and externally of said bore portion, an elongated carrying means for said wedge, said carrying means having a handle means at one end portion, said carrying means having means at the other end portion adapted and constructed to pass through said keyway into said chamber whereby when said carrying means is rotated said wedge and said carrying means are locked together.

4,372,597

SUBMERSIBLE EQUIPMENT HANDLING SYSTEM

Gordon B. Stillman, Liverpool, and Charles R. White, Manlius, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,406
Int. Cl.³ B66C *1/00*
U.S. Cl. 294—67 DA **7 Claims**

1. For use in deploying and retrieving a submersible object suspended below a surface platform by a main support line depending therefrom, an object handling system comprising, in combination:

(a) a messenger device engaging said main support line and including centering means operable to maintain said mes-

senger device in centered relationship with respect to said line when lowered thereon;

(b) messenger fit means including a plurality of messenger support cables, means carried by said surface platform for paying out and taking in said cables, and means attaching the lower ends of said cables to said messenger device at relatively widely spaced points thereon;

(c) guide means for angularly orienting said submersible object and said messenger device including a guide ramp element and a guide follower element, means mounting one of said guide elements to said object centrally with respect to its point of attachment to said main support line, and means mounting the other of said guide elements to said messenger device centrally with respect to its points of attachment to said support cables, whereby as said object and messenger device are brought into engagement by relative vertical movement said guide ramp and follower elements will rotate the object and messenger device into predetermined angular relationship with respect to each other; and

(d) latch means carried by said object and said messenger device at locations symmetrically disposed with respect to said main support line and spaced therefrom, said latch means being operable upon attainment of said predetermined angular relationship between said object and said messenger device to lock them together for retrieval to said surface platform by lift of said messenger support cables.

4,372,598

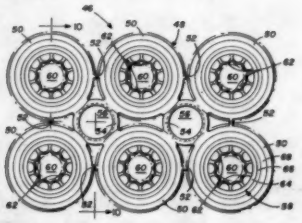
CONTOUR BOTTLE CARRIER

Albert G. B. Quelch, 5841 Melshire Dr., Dallas, Tex. 75230

Continuation-in-part of Ser. No. 177,244, Aug. 11, 1980. This application Jan. 19, 1981, Ser. No. 226,452

Int. Cl.³ B65D *71/00*

U.S. Cl. 294—87.2 **5 Claims**



1. Apparatus for carrying a plurality of bottles, which comprises:

a generally flat frame having top and bottom surfaces;

said frame including a plurality of openings therein arranged in at least one spaced apart pair;

a pair of inner and outer cups associated with each opening in said frame, said cups each having upper and lower ends and being interconnected at the lower ends, the upper end of each outer cup being smaller in diameter than the corresponding frame opening and including a recessed annular flange peripherally connecting the upper end of said outer cup and the bottom surface of said frame, said flange being adapted to receive the heel of a bottle stacked upon said apparatus; and

the upper end of each inner cup comprising a predetermined bottle receiving opening defined by hollow sections circularly arranged and adapted to receive and retain a bottle by its neck.

4,372,599

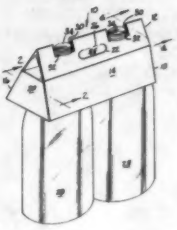
CROWN SUPPORT BEVERAGE CARRIER

Randall A. Kiedaisch, Deforest, Wis., and Leonard M. Cooper, Bradley, Ill., assignors to Manville Service Corporation, Denver, Colo.

Filed Mar. 2, 1981, Ser. No. 239,816

Int. Cl.³ B65D *71/00*

U.S. Cl. 294—87.2 **2 Claims**



1. A production blank for a crown support beverage carrier comprising:

(a) a first inner side wall panel;

(b) a first outer side wall panel hingedly attached to the first inner side wall panel;

(c) a first upper outer panel section hingedly attached to the first outer side wall panel and having formed therein a handle opening;

(d) a second upper outer panel section hingedly attached to the first upper outer panel section and having formed therein a handle opening, the first upper outer panel section and the second upper outer panel section having formed therein and lying therebetween at least two bottle neck receiving openings;

(e) a second outer side wall panel hingedly attached to the second upper outer panel section and having formed thereon, on each side thereof an end wall panel, each end wall panel having formed thereon a glue flap;

(f) a second inner side wall panel hingedly attached to the second outer side wall panel;

(g) a first upper inner panel section hingedly attached to the second inner side wall panel and having formed thereon a handle opening;

(h) a first elongated inner panel section hingedly attached to the first upper inner panel section;

(i) a second elongated inner panel section hingedly attached to the first elongated inner panel section, the first and second inner panel sections having formed thereon and positioned therebetween at least two bottle neck receiving openings; and

(j) a second upper inner panel section hingedly attached to the second elongated inner panel section and having formed thereon a handle opening.

4,372,600

BOTTLE CARRIER

Russel W. Leib, Jr., Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

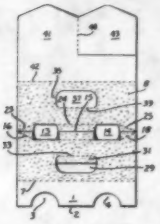
Continuation of Ser. No. 137,909, Apr. 7, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,383

Int. Cl.³ B65D *71/00*

U.S. Cl. 294—87.2 **8 Claims**

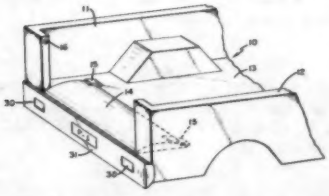
1. A bottle carrier comprising a bottom wall having a plurality of neck receiving apertures, a pair of side walls joined respectively along their bottom edges to the side edges of said bottom wall, each of said side walls being formed of inner and outer panels secured together in face contacting relation, a plurality of top receiving apertures formed in the upper portions of said side walls and disposed respectively in aligned relationship with said neck receiving apertures, a side wall

extension panel foldably joined to one of said outer panels and extending generally downwardly therefrom and disposed in an



overlying relationship with the shoulder portion of at least one bottle, and a cushioning panel joined to said side wall extension panel and extending generally laterally inwardly therefrom.

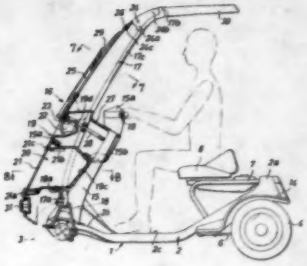
4,372,601
AIR DRAG REDUCING TAIL GATE
Michael C. Smith, 211 Bonaventure Dr., LaGrange, Ga. 30240
Filed May 28, 1981, Ser. No. 268,101
Int. Cl.³ B60J *5/12*
U.S. Cl. 296—50 **8 Claims**



1. In a vehicle of the type having a cargo compartment formed by at least two side walls and a bed, the improvement comprising an air drag reducing tail gate adapted to rotate about an axis parallel to and substantially coincident with its lower edge to move into the cargo compartment of the vehicle and become aligned in air drag reducing position adjacent to said bed to minimize air drag and increase fuel efficiency while retaining maximum utility and safety.

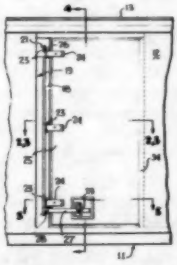
4,372,602
SMALL-SIZED VEHICLE
Toshio Tsuchiya, Kawagoe; Akito Enokimoto, Asaka; Sadao Mizushima, Tokyo, and Suwaji Takano, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 28, 1980, Ser. No. 201,530
Claims priority, application Japan, Oct. 31, 1979, 54-14069
Int. Cl.³ B62J *17/00*
U.S. Cl. 296—78 R **12 Claims**

12. A small-sized vehicle, comprising:
a vehicle body having a pair of front wheels;
a handlebar for steering said front wheels, said handlebar being disposed substantially centrally in the width direction of a front portion of said vehicle body;
a driver's seat disposed substantially centrally in the longitudinal direction of said vehicle body;
a footrest floor extending between said handlebar and said seat;
a windshield unit mounted on and extending upwardly and rearwardly from a front end of said vehicle body so as to be disposed in overhanging relation to said handlebar and said driver's seat;
said windshield unit including a container therein;



said windshield unit including a lower cover; and
said container being provided with a hinged lid comprising a part of said lower cover.

4,372,603
DOUBLE PIVOT DOOR FOR CARGO VEHICLES
Edmund A. Stanczak, and Stephen J. Ringe, both of Detroit, Mich., assignors to Fruehauf Corporation, Detroit, Mich.
Continuation of Ser. No. 970,315, Dec. 18, 1978, abandoned.
This application Oct. 21, 1980, Ser. No. 198,991
Int. Cl.³ B60J *1/00*
U.S. Cl. 296—146 **19 Claims**



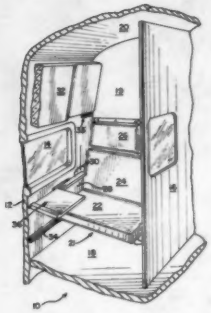
15. In a van body having a side wall of predetermined thickness, said side wall having an outer surface and having a door opening therein, the combination of a door sized to fill the door opening and being of a thickness commensurate with that of said side wall, sealing means interposed between the periphery of said door and the margin of said side wall defining said door opening, and hinge/keeper means mounted substantially flush with respect to said side wall and said door for controlling initial opening and terminal closing motions of said door to preserve the integrity of said sealing means while permitting the door to swing substantially 180° between its fully open and fully closed positions, said door and said hinge/keeper means being mounted in recessed relationship with respect to said outer surface of said side wall when the door is in its closed position.

4,372,604

STOWABLE ARMREST TABLE ASSEMBLY

William Raksanyi, Hammond, and Ronald W. Marsh, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 6, 1980, Ser. No. 194,193
Int. Cl.³ A47B 83/02
U.S. Cl. 297—162 5 Claims



1. A stowable armrest table assembly movable from a stowed, non-use position to an upright, use position for a seating unit having an armrest, said assembly comprising

a support sleeve having an internal contour secured to a side of the armrest;

a support bar extending through the sleeve;

a platform assembly having a table portion spaced from said support bar to define a space having a width greater than the thickness of said support sleeve and a ledge portion at the upper end of said table portion secured to said support bar at one end thereof;

blocking means on the other end of the bar to prevent movement of said other end through the sleeve;

a retaining member fixed to the bar intermediate of the ends, said retaining member having a shape corresponding to the interior profile of the sleeve and

said retaining member not being within said support sleeve and said blocking means not being in contact with said sleeve when said platform assembly is in said non-use position and said retaining member being within said support sleeve and said blocking means being in operational contact with said sleeve when said platform assembly is in said use position.

4,372,605

HAIRDRESSER CHAIR

Victoria Cervantes, 5538 Capellina Way, Santa Barbara, Calif. 93111

Filed Oct. 3, 1980, Ser. No. 193,655
Int. Cl.³ A47C 7/62, 1/04
U.S. Cl. 297—192 2 Claims

1. A hairdresser chair comprising:

a stanchion assembly;

a base, said stanchion assembly being mounted on said base;

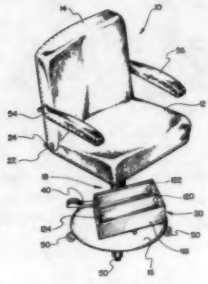
a seat mounted on said stanchion assembly, said seat having a substantially planar seating surface and bottom surface;

a back connected by connecting means to said seat, said back having a substantially planar front surface, said front surface being substantially perpendicular to said seating surface;

a pair of spaced-apart arms being attached to said back, each of said arms being individually pivotally connected to said back, each said arm being movable between an extended position and a retracted position, said retracted position being when a said arm is totally located against said back, said extended position is when a said arm extends outwardly from said front surface;

a tray assembly being pivotally mounted on said stanchion assembly, said tray assembly being located directly adjacent said bottom surface,

said tray being pivotally attached to said arm assembly for movement between a usable position and a storage position, said storage position not permitting access to any contents contained within said tray; and



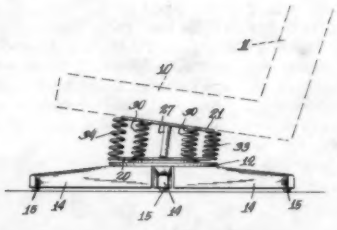
said tray includes at least one article supporting drawer, said drawer being pivotally mounted within said tray, movement of said tray to said storage position causes said drawer to pivot in respect to said tray thereby not permitting access into said drawer.

4,372,606

ROCKER STRUCTURE FOR ROCKING CHAIRS

James K. Faull, Rte. #1, Box 156, Enon Valley, Pa. 16120

Filed Sep. 29, 1980, Ser. No. 191,866
Int. Cl.³ A47C 3/02
U.S. Cl. 297—265 7 Claims



1. A rocking structure for a chair, comprising:

a pair of generally horizontally-disposed rigid plates, one spaced vertically above and in line with the other, the upper plate being adapted for connection to the seat of the chair, said plates having corresponding opposite side margins, and corresponding front and rear margins which, when said upper plate is connected to the chair seat, face the front and rear of the chair,

means connected to the lower plate and including legs for supporting the chair from a floor surface,

a pair of rigid posts extending transversely between said plates, each post disposed inwardly of a respective one of the opposite side margins of said plates, and each post having its upper and lower ends engaging respective facing surfaces of said upper and lower plates at a localized place intermediate the length of a respective side margin in a manner to provide rocking movement of said upper plate relative to said lower plate and in turn provide

for rocking movement of the chair seat in a direction from the front to the rear and vice versa, and

a pair of coil springs disposed on opposite sides of each post in line with the rocking movement of said upper plate, said springs drawing said plates toward each other and yieldably opposing rocking movement of said chair seat.

4,372,607

FORWARDLY INCLINING SEAT

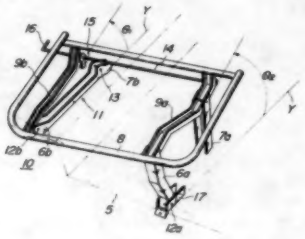
Yoichi Mizushima, Yokohama, and Taketoshi Hosonaga, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 2, 1980, Ser. No. 193,258

Claims priority, application Japan, Oct. 3, 1979, 54-127794

Int. Cl.³ B60N *1/02*

U.S. Cl. 297—325 **2 Claims**



1. In combination: a vehicle having a vehicle floor with a first portion at one side of the vehicle at a first level, and a second portion spaced laterally from said first portion towards the center of the vehicle and at a second level higher than said first level, a seat having a support frame for supporting a seat cushion normally horizontally in said vehicle, first and second leg support frames fixed to said support frame at laterally spaced apart positions above said first and second portions respectively, first and second front and rear support legs respectively fixed to said first and second leg support frames, and means for respectively rotatably supporting said front support legs about a common axis inclined obliquely with respect to said first level, said rear support legs being movable away from said floor, whereby said seat is adapted to be rotated about said axis and said seat inclined forwardly and lifted upwardly towards said center about said axis.

4,372,608

TREATMENT CHAIR

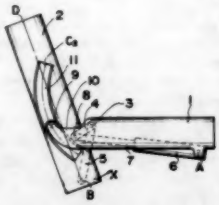
Mitsuhiko Hotta, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Dec. 4, 1980, Ser. No. 213,006

Claims priority, application Japan, Dec. 6, 1979, 54-169583[U]

Int. Cl.³ A47C *1/024*

U.S. Cl. 297—361 **4 Claims**



1. An improved chair of the type comprising (a) a seat frame, (b) a roller supported at the end of said seat frame, (c) a backrest frame, (d) a guide fixed in location with respect to said backrest frame adapted to rotatably fit said roller therein and (e) a driving mechanism connected to said seat frame and to said backrest frame for causing a point on the lower end of said backrest frame to arcuately travel along a path lying below the position in which said frame rotates in contact with said roller;

wherein the improvement comprises said guide groove comprising an arcuate portion having a center curvature on the front side of said backrest frame facing said seat frame and located so as to result in the peripheral speed of the upper portion of said backrest frame being maintained at a constant value during the raising and lowering of said backrest frame.

4,372,609

VEHICLE SEATS COMPRISING A SHELL-SHAPED FRAME

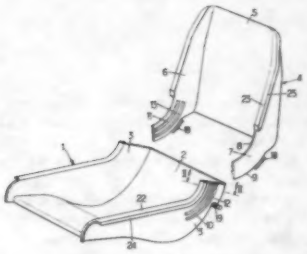
Bernard Boisset, Etampes, France, assignor to Societe Industrielle Bertrand Faure, Etampes, France

Filed Nov. 6, 1980, Ser. No. 204,697

Claims priority, application France, Nov. 14, 1979, 79 28118

Int. Cl.³ A47C *1/025*

U.S. Cl. 297—362 **8 Claims**



1. A vehicle seat, comprising:

a sitting portion shell for a sitting portion cushion, this sitting portion shell having a rear and two laterally opposite vertical flanges; and

a seat back including a frame having a base, this base comprising two laterally opposite downwardly, forwardly curving lugs;

means defining a set of first circularly arcuate rib and groove means on each of said vertical flanges of said sitting portion shell and means defining a complimentary set of second circularly arcuate rib and groove means on each of said lugs of said seat back frame base;

each said set of first rib and groove means being arcuately, slidingly interdigitated with a respective said set of second rib and groove means being arcuate about a transverse horizontal axis situated in the expected vicinity of the pivoting axis of the hips of the seat occupant and concave forwards and upwards, so that downward movement of the seat back is accompanied by rearward tilting of the seat back relative to the sitting portion shell; and

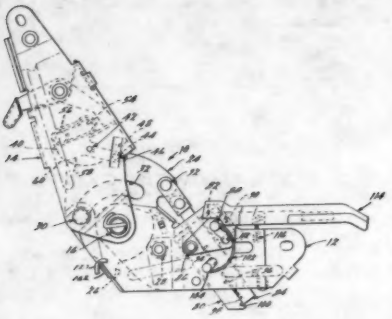
adjustment means associated between said sitting portion shell and said seat back frame operable when manipulated by a given amount to slide the first and second sets of rib and groove means arcuately relative to one another by a corresponding amount, for erecting and reclining the seat back relative to the sitting portion shell.

4,372,610

SILENT SEAT BACK RECLINER MECHANISM

Alfred J. Fisher, III, Grosse Pointe Farms, and Robert L. Bell, Oxford, both of Mich., assignors to Fisher Corporation, Troy, Mich.

Filed Sep. 25, 1980, Ser. No. 190,583
Int. Cl.³ A47C 1/025
U.S. Cl. 297—367 4 Claims



1. A latch mechanism for controlling rotation of a vehicle seat back to a reclining position relative to a vehicle seat, said mechanism comprising

a seat bracket attachable to said vehicle seat,

a seat back bracket,

a seat back bracket pivot pin joining said seat bracket and seat back brackets for relative rotation,

a quadrant supported by said seat back bracket pivot pin for rotation relative to both seat bracket and seat back bracket,

stop means for said quadrant for limiting rotation of said seat back bracket relative to said quadrant,

an arm pivot pin on said quadrant radially spaced from said seat back bracket pivot pin,

an arm rotatably secured on said arm pivot pin and extending between the arm pivot pin on said quadrant and said seat bracket for controlling the rotative position of said quadrant relative to said seat bracket, said arm having teeth on one side thereof,

a pawl support pin on said seat bracket,

a pawl rotatably secured on said pawl support pin having a toothed portion engageable with the teeth on said arm,

an arm clamp engageable with said arm on the opposite side thereof from the teeth thereon, and,

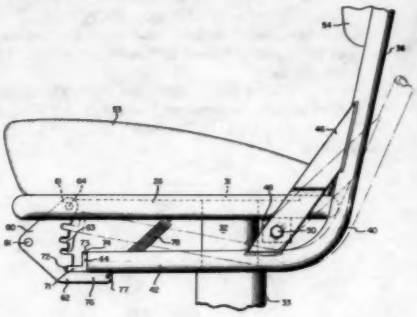
a manual operator movable between a locked and an unlocked condition, movement of said manual operator from the locked to the unlocked condition effecting movement of said arm clamp relative to both said pawl and said arm whereby said arm is unlocked for movement relative to said pawl, movement of said arm clamp conditioning said arm and pawl for rotation about said arm pivot pin and said pawl support pin respectively thereby to change the angular relationship between said arm and pawl to disengage the teeth thereon whereby said seat back bracket is positionable at a desired rotational position relative to said seat bracket.

4,372,611

SEAT WITH ADJUSTABLE BACK

Lester H. Feddeler, Elk Grove Village, Ill., assignor to Couch and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Nov. 28, 1980, Ser. No. 211,373
Int. Cl.³ A47C 1/025
U.S. Cl. 297—371 4 Claims



1. A seat with an adjustable back frame, said seat comprising:

a substantially horizontally disposed seat frame having front and rear ends;

a substantially vertically disposed back frame having top and bottom ends;

means pivotally connecting said back frame, adjacent its bottom end, to said seat frame adjacent the rear end of the latter, and mounting said back frame for movement about a first horizontal pivotal axis extending from side to side on said seat;

a pair of spaced-apart members, each extending from said back frame, adjacent the bottom end thereof, forwardly therefrom and each terminating at a respective forward end located in front of said first horizontal pivotal axis;

a pair of spaced-apart latch plates each having upper and lower ends and a plurality of notches therebetween;

means pivotally connecting each latch plate, adjacent its upper end, to said seat frame forwardly of said first horizontal pivotal axis, and mounting said latch plate for movement about a second horizontal pivotal axis extending from side to side on said seat;

a bar extending between the forward ends of said spaced-apart members, said bar comprising means for individually engaging the notches on each of said latch plates to lock said back frame against pivotal movement about said first horizontal pivotal axis;

means normally urging both of said latch plates in a pivotal direction toward said bar to releasably engage an individual notch on each plate with said notch-engaging means on sad bar;

a lower part on said bar;

a rearwardly extending projection at the bottom end of each latch plate;

means on the lower part of said bar for abutting against said rearwardly extending plate projections to limit pivotal movement of said back frame in one pivotal sense;

said pivotal connecting means for the latch plates comprising means mounting each latch plate for movement between an engaging position with said bar and an unengaged position of maximum displacement from said engaging position and at which said latch plate abuts against said seat frame at a location to the front of said second horizontal pivotal axis;

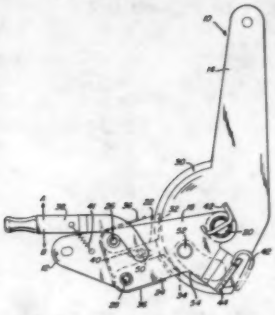
said rearwardly extending projections comprising means abuttable with said lower part of said bar when said latch plate is in said position of maximum displacement.

4,372,612

INFINITELY VARIABLE SEAT RECLINER MECHANISM

John W. Wiers, Romeo; Daniel W. Roper, Rochester, and Richard F. Johnson, Bloomfield Hills, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 30, 1980, Ser. No. 173,778
Int. Cl.³ A47C 1/027
U.S. Cl. 297—374 4 Claims



1. An adjustable positioning device comprising:

a first member and a second member being pivotally connected to permit relative rotation of said members about an axis of rotation;

second member having a circular friction surface thereon with its center at said axis of rotation;

a pair of locking pawls pivotally mounted on said first member and being capable of rotation about spaced centers and into at least point contact at one end of each said pawl with said circular friction surface of said second member;

means for biasing said locking pawls in opposite circumferential directions relative to said circular friction surface to urge said one end of each of said pawls into said point contact with said circular friction surface;

each of said locking pawls having a grooved surface on said one end thereof, said friction surface of said second member having a cross section capable of mating with said grooved surface in said locking pawls, said biasing means tending to force said grooved surface of said one end of said locking pawls into wedging engagement with said friction surface of said second member whereby relative rotation between said first member and said second member in a first direction is prevented by the greater wedging engagement between one of said locking pawls and said friction surface and relative rotation in the other direction is prevented by the greater wedging engagement between the other of said locking pawls and said friction surface; and

means for pivotally moving said locking pawls against said means for biasing and out of engagement with said friction surface of said second member to allow relative movement between said first member and said second member.

4,372,613

CASING FOR SEAT-BELT RETRACTOR

Toshiyuki Kitakami, and Yoshinori Akiyama, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

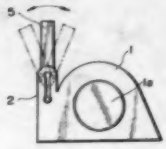
Filed Nov. 21, 1980, Ser. No. 209,175
Claims priority, application Japan, Nov. 28, 1979, 54-165415[U]
Int. Cl.³ A47C 31/00; A62B 35/00
U.S. Cl. 297—481 4 Claims

1. A casing for a seat-belt retractor comprising:

(a) a housing for retracting a seat belt therein when the tension of the seat belt is released, said housing having an opening for passing the seat belt therethrough and a dumbbell shaped slot provided on each of two opposite side thereof;

(b) a flexible rectangular webbing guide sleeve through which the seat belt is passed, said sleeve being fitted within the opening of said housing; and

(c) a pair of pins implanted in said sleeve for connecting said sleeve to said housing, said pins extending through the slots



in a manner to permit said sleeve to telescopically extend from a first position essentially within said housing to a second position extending therefrom, said pins being snap-fitted to the wider end portions of respective slots for selectively retaining said sleeve in either of its two positions,

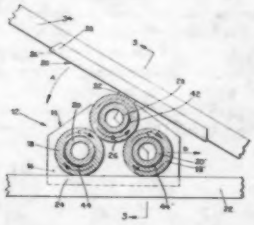
whereby when said sleeve is in its second position, said sleeve is permitted to bend from the axis of movement within said housing.

4,372,614

ROTATING WEDGE FOR BLOCKING UP THE DUMPING PLATFORM OF A TRUCK IN DUMPING POSITION

Jacques Fortier, Huberdeau, Comte d'Argenteuil, Quebec, Canada (J0T 1G0)

Filed May 12, 1981, Ser. No. 263,187
Int. Cl.³ B60P 1/04
U.S. Cl. 298—17 B 8 Claims



1. A pivoted wedge for blocking up the dumping platform of a dumping truck in dumping position, comprising a main body, a pair of driven rotating means rotatably mounted in the main body for riding on the frame of the truck and allowing translation of the body along said frame, and driving means rotatably mounted in the main body for riding on the frame of the dumping platform, said driving means positively engaging both driven means and rotating them toward the junction between the frame of the truck and the frame of the platform when the dumping platform is moving down, thus causing movement to the wedge toward the junction and self blocking of the platform in dumping position.

4,372,615

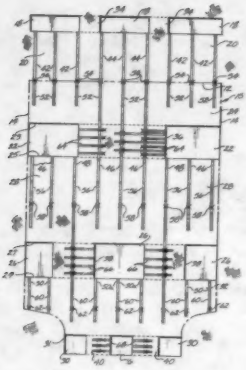
METHOD OF RUBBLING OIL SHALE

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 75,846, Sep. 14, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 192,330

Int. Cl.³ E21C *41/10*; E21B *43/263*

U.S. Cl. 299—2 39 Claims



1. A method of recovering shale oil from a subterranean formation containing oil shale which comprises the steps of:

excavating formation to form at least one void in the subterranean formation leaving zones of unfragmented formation above and below such a void, such a zone of unfragmented formation having a center and a substantially horizontal free face adjoining the void;

placing explosive into at least one of the zones of unfragmented formation;

forming a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort in the subterranean formation by detonating such explosive for explosively expanding the unfragmented formation in such a zone of unfragmented formation in a single round for moving formation located at about the center of such zone of unfragmented formation a greater distance in a given time interval after beginning of the single round than formation located in such zone of unfragmented formation outward from about the center of such zone of unfragmented formation;

introducing gas into the fragmented permeable mass in the in situ oil shale retort for establishing a retorting zone in the fragmented permeable mass wherein oil shale is retorted to produce gaseous and liquid products, and for advancing the retorting zone through the fragmented permeable mass; and

withdrawing the gaseous and liquid products from the in situ oil shale retort.

4,372,616

METHOD FOR RESTORING FORMATION PREVIOUSLY LEACHED WITH AN AMMONIUM LEACH SOLUTION

James M. Paul, and Wilton F. Espenscheid, both of DeSoto, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,728

Int. Cl.³ E21B *43/28*

U.S. Cl. 299—5 3 Claims

1. A method for restoring to environmentally acceptable levels the ammonium ion content in a subterranean formation that has been subjected to in situ oxidative leaching with an ammonium leach solution which comprises passing through said formation a restoration fluid containing carbonic acid.

4,372,617

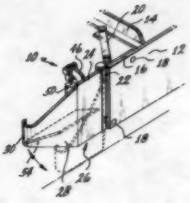
ICE EDGER FOR ICE RESURFACING MACHINE

Frank J. Zamboni, Paramount, Calif., assignor to Frank J. Zamboni & Co., Paramount, Calif.

Filed Jan. 5, 1981, Ser. No. 222,482

Int. Cl.³ E01H *5/12*

U.S. Cl. 299—24 10 Claims



1. An edging apparatus for use on an ice surface modifying machine of the type which includes an ice modifying component capable of shaving an ice surface which comprises:

a guide means, at least a portion of said guide means capable of being located adjacent to and following the contours of a projecting surface which is located next to and extends above an ice surface;

an ice shaving means including an ice shaving edge, said ice shaving means operatively associated with said guide means with at least said ice shaving edge formed as a structure independently of said guide means, at least said shaving edge movable in a vertical direction with respect to said ice surface between a shaving position wherein said shaving edge is capable of contacting and shaving said ice surface and a non-shaving position wherein said shaving edge is lifted vertically to a position above said ice surface, at least in said shaving position one of the ends of said shaving edge being located in close association with said portion of said guide means capable of being located adjacent to said projecting surface;

pivoting means operatively connecting said guide means and said ice shaving means to one of the side edges of said machine so as to allow said guide means and said ice shaving means to pivot between an extended position wherein at least said portion of said guide means capable of being adjacent to said projecting surface is extended outwardly from the plane of the side edge of said machine and a retracted position wherein both of said guide means and said ice shaving means do not essentially extend beyond the plane of said side edge;

positioning means reversibly retaining said guide means and said ice shaving means in said retracted position and said extended position.

4,372,618

SELF-ADVANCING MINERAL MINING INSTALLATION INCLUDING TILTING MACHINE SUPPORT

John T. Pearey, Pontefract, England, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 55,283, May 7, 1979, Pat. No. 4,272,129. This application Feb. 27, 1981, Ser. No. 238,700

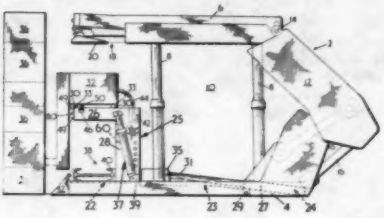
Claims priority, application United Kingdom, Jul. 14, 1978, 29859/78

Int. Cl.³ E21C *29/02*

U.S. Cl. 299—31 18 Claims

1. A mineral mining installation includes a self-advancing roof support unit having a roof engaging member and a floor-engaging member, a forward base part independent of the

floor-engaging member and connectible thereto, the forward base part being movable relative to the floor-engaging member, a machine supporting element adapted to be mounted on said forward base part at a level above that of the base part, the element being provided with means for supporting and guiding



a mineral mining machine, a tilting jack operable between the machine supporting element and the roof support unit for varying the attitude of the machine supporting element, and a conveyor receiving area defined beneath the machine supporting element and adapted to locate a conveyor.

4,372,619

CHAIN HAVING LONGITUDINAL STIFFNESS USED WITH HAULING AND CUTTING EQUIPMENT

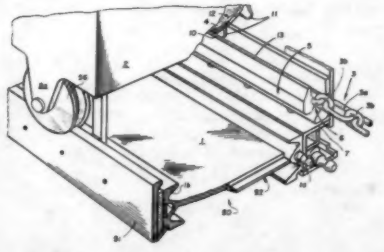
Gert Braun, Essen-Heisingen, Fed. Rep. of Germany, assignor to Halbach & Braun, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,900

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938408

Int. Cl.³ E21C *29/10*

U.S. Cl. 299—43 **6 Claims**



1. Hauling and cutting equipment, comprising a conveyor trough having a longitudinal side wall on each side, a support rail structure on at least one side of said trough having a chain guide groove therealong, a link chain extending in said chain guide groove along said support structure, a winning machine overlying said trough and guided on said rail structure, a drive for said winning machine including at least one chain wheel on said winning machine having teeth engaging in said link chain and having vertical link receiving divisions between said teeth, said link chain comprising a round link chain having alternate long horizontal links and short vertical links of a shorter length than said horizontal links, a clear division of said vertical links being substantially double the link diameter of said horizontal links except for a predetermined amount of play spacing, the engagement division of said chain wheel being substantially equal to the length of said vertical links, said vertical links have link arcs with an inside radius corresponding in the contact region with said horizontal link to the inside radius of the link arc of said horizontal link.

4,372,620

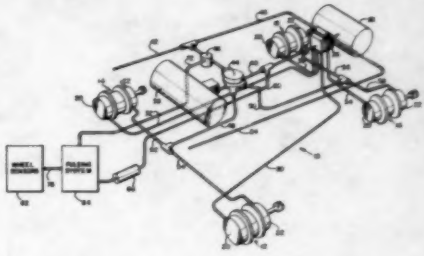
ANTI-LOCKING BRAKE SYSTEM FOR A VEHICLE

George Mekosh, Jr., Warrington, Pa., assignor to The Budd Company, Troy, Mich.

Filed Feb. 4, 1981, Ser. No. 231,458

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—99 **8 Claims**



1. In combination with a source of service pressure for application to a brake to decelerate a vehicle,

(a) a control valve disposed to open and close, connected between said source of service pressure and said brake;

(b) a first source of pressure connected to maintain said control valve open to permit said service pressure to be applied to said brake;

(c) a fluid pulse generator for generating fluid pulses normally maintained inoperative by said first source of pressure;

(d) a wheel sensor responsive to the rotation of said wheel;

(e) said wheel sensor including normally closed switching means to maintain said pressure at said first source and responsive to deceleration of said wheel in excess of a predetermined rate to open and exhaust said pressure at said first source;

(f) a fluid gate valve connected to said fluid pulse generator;

(g) a second source of pressure connected to said fluid gate valve to apply fluid pressure therethrough to said fluid pulse generator when said first source of pressure is below a predetermined level to activate said fluid pulse generator to cause said fluid pulses to be applied to said control valve, and

(h) means for applying said fluid pulses to switch said control valve on and off to permit said service pressure to be applied to said brake to be switched on and off when said fluid pulses are being generated.

4,372,621

BALL AND SOCKET JOINTS

David J. R. Farrant, Radford Semele, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Jul. 2, 1980, Ser. No. 165,346

Claims priority, application United Kingdom, Jun. 5, 1979, 7923438

Int. Cl.³ F16C *11/06*

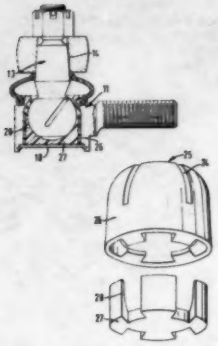
U.S. Cl. 308—2 R **4 Claims**

1. A composite plastics support bearing for the ball of a ball and socket joint comprising:

a hard plastics bearing member for the ball in the socket; and

a relatively soft plastics cushion member held by said bearing member so as to be stressed by contact with the ball on assembly of the joint, said bearing member and cushion member being interlocked by co-operating pre-formed profiles of the members to prevent relative rotation, the

bearing member being a collar for the ball and the cushion member being a plug with radial arms which fits into and



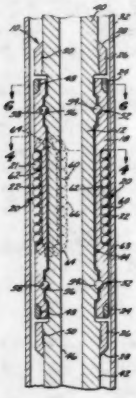
closes a correspondingly radially notched end of the collar.

4,372,622

RECIRCULATING BEARING ANTIFRICTION SYSTEM FOR WELL STRINGS

Alton E. Cheek, 1949 Vuelta Grande Ave., Long Beach, Calif. 90815

Filed Nov. 17, 1980, Ser. No. 207,740
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—4 A **4 Claims**



1. Apparatus for reducing friction between a well string and a well conduit containing such string which comprises:

a plurality of linear arrays of rollable bearing elements exposed on the outside of said string,

each of said arrays being generally longitudinally oriented on said string,

a plurality of endless bearing races in said string, said rollable bearing elements of each of said arrays being contained for free flowing movement in a respective said race, said arrays and their respective races being located at regularly spaced intervals about said string at a substantially common longitudinal position on said string,

generally cylindrical cage means within which said bearing races are contained, said cage means being peripherally located on said well string, and

generally cylindrical mandrel means on said string,

said mandrel means being generally coaxial within said cage means, and

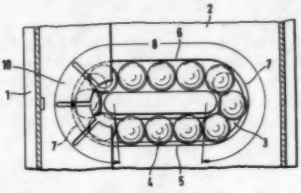
annular rollable bearing means engaged between said cage means and said mandrel means.

4,372,623

RECIRCULATING BALL BEARING

Hartumut Koschmieder, Erlangen, Fed. Rep. of Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Fed. Rep. of Germany

Continuation of Ser. No. 68,639, Aug. 22, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,902
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837740
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **13 Claims**



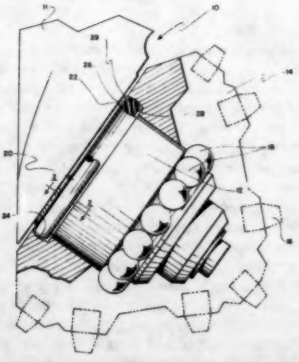
1. A ball bearing for longitudinally moveably mounting of a shaft comprising an outer race sleeve and a concentrically disposed guide sleeve with a plurality of ball races distributed over its circumference, each of the said ball races consisting of two straight race sections extending essentially parallel to the bearing axis and two semi-circular race sections connecting the two straight race sections and a plurality of balls guided in the races under load in only one straight race section and under no load in the remainder of the race section, the improvement comprising providing at least one elastically yielding spring element pressing on the unloaded balls in the remainder of the race section.

4,372,624

DYNAMIC O-RING SEAL

William J. Neilson, Murrieta, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 4, 1981, Ser. No. 270,452
Int. Cl.³ F16C *33/74*
U.S. Cl. 384—94 **9 Claims**



3. An O-ring shaft seal to isolate a lubricated bearing from an external environment comprising a resilient O-ring confined

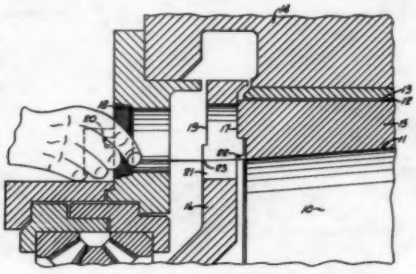
within an annular chamber, said chamber being formed, between a bearing journal and a rotating part mounted thereon, said rotating part is a rock bit cutter cone, by the cooperation of two substantially radial surfaces and two concentric and substantially cylindrical surfaces formed between said journal and said rotating part, with at least one of said cylindrical surfaces being shaped substantially in a V with a vertex positioned about centrally on the cylindrical length, and directed so as to enlarge said annular chamber at said vertex, differential pressure across said O-ring moves said O-ring axially from said vertex thereby increasing the sqeeze on said O-ring thus resisting egress of lubricant from a bearing or ingress of a material from said external environment into said bearing.

4,372,625

METHOD AND APPARATUS FOR CHECKING MILL ROLL BEARING ASSEMBLY

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Sep. 11, 1981, Ser. No. 301,372
Int. Cl.³ F16C *33/08*
U.S. Cl. 384—129 **4 Claims**



3. A mill roll bearing assembly including a mill roll having an end roll neck coaxially received in a bearing sleeve journaled for rotation therewith in a housed bearing and a sleeve retainer secured to the annular outside end of said sleeve and annularly covering the outside end of said sleeve where it annularly mates with the outside end of said roll neck within the housing for said bearing, the improvement comprising, an inspection passage through an upper end portion of said bearing housing which reveals the then rotatably positioned uppermost end portion of said retainer where it annularly mates with the outside end of said bearing sleeve, a removable closure for said housing inspection passage, and an inspection passage through the end of said retainer near the outer peripheral edge thereof which reveals a portion of the outside ends of said sleeve and roll neck where they annularly mate so that a feeler gauge may be inserted through said passages when aligned to check whether the roll neck is fully seated in the bearing sleeve.

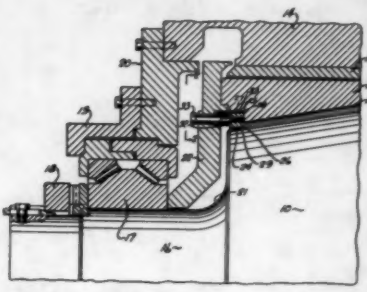
4,372,626

TAPER JOURNAL BEARING FOR ROLLS FOR USE IN ROLLING MILLS

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Sep. 11, 1981, Ser. No. 301,373
Int. Cl.³ F16C *33/04*
U.S. Cl. 384—129 **5 Claims**

1. A taper journal bearing for rolls for use in rolling mills, comprising a bushing housed in a roll bearing chock, a sleeve closely fitted onto a taper journal end of the roll, an oil film deposited between said bushing and said sleeve, and key means for fixing said sleeve to said roll; the improvement comprising, said key means consisting of a flat machined outer end of the taper on the surface of the taper journal of said roll in parallel to the taper thereof and underlying one end of said sleeve, a keyway in said one end of said sleeve and open to and registering with said flat, a key slidably received in said keyway and



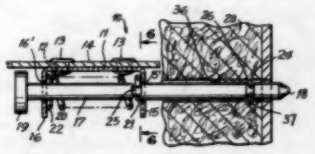
having a tapered flat surface mating in sliding engagement with said flat to create a wedging action against said flat when said key is slidably urged into said keyway.

4,372,627

RETRACTABLE DAMPER BEARING ASSEMBLY

Milton Hinden, Massapequa, N.Y., assignor to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,322
Int. Cl.³ F16C *23/02*
U.S. Cl. 384—260 **4 Claims**

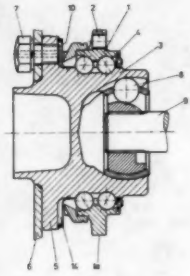


1. A retractable damper bearing assembly for supporting the undriven end of a damper blade for rotation in a duct, and particularly an insulation lined duct, comprising a mounting plate adapted to be secured to said blade, inner and outer leg members extending from said plate in spaced parallel relation, each said leg member including an aperture, said apertures being disposed in coaxial alignment parallel to said plate, a bearing rod slidably extending through said apertures and having a free end portion, said rod being shiftable between a retracted position whereat said free end is disposed outwardly adjacent said outer leg and an extended position whereat said free end of said rod is displaced outwardly from said retracted position, a first seat portion on said rod, said seat portion in said extended position of said rod being disposed inwardly of said outer leg, a coil spring member convoluted about said rod, said spring member being disposed between and having its opposed ends bearing against said legs, detent means on said spring member adjacent said outer leg, said detent means being biased into engagement with said seat portion responsive to movement of said rod from said retracted to said extended position.

4,372,628
BEARING ASSEMBLY

Heinz Kiener, Waigolshausen; Günter Neder, Schweinfurt, and Rainer Schürger, Schwanfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,607
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024397
Int. Cl.³ F16C *33/76*
U.S. Cl. 308—187.1 11 Claims

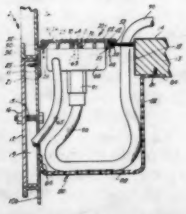


1. In a bearing assembly particularly for wheel bearings comprising an inner ring having at least one radially outwardly directed fastening flange, an outer ring spaced radially from the inner ring defining an annular space therebetween and having an axial end face spaced axially from said fastening flange, a plurality of rolling elements in the annular space between the rings, a cap secured to the inner ring having a radial section extending between the outer ring and fastening flange and having at least a portion thereof spaced axially from the radial face of said fastening flange to define a space therebetween and a seal ring fastened to the outer ring having a sealing lip which slides on the cap, said space between the radial cap section and the fastening flange of said inner ring being filled at least partly with means to inhibit heat transfer from the inner ring to the cap.

4,372,629
COMBINATION WIRE ENCLOSURE AND WIRE

Paul L. Propst, Holland; Donald A. Richardson, Kentwood, and Carl B. Hinrichs, Grand Haven, all of Mich., assignors to Stow/Davis Furniture Company, Grand Rapids, Mich.

Filed Nov. 10, 1980, Ser. No. 205,684
Int. Cl.³ A47B *17/00, 96/18*
U.S. Cl. 312—223 13 Claims



1. A wire enclosure assembly for furniture comprising two panel portions spaced from each other and defining a longitudinally extending slot with an outer surface area adjacent said slot, said slot having first and second sides;

a wire raceway adjacent said slot, and said slot communicating with said raceway and the space outwardly of said surface area; and

means for flexibly sealing said slot;

wherein the improvement comprises said sealing means comprising:

a plurality of flexible bristles in a brush-like configuration extending between said first and second sides and confined inwardly of said surface area, each of said bristles having a mounting end and a free end, a substantial proportion of said free ends being located immediately adjacent said first side;

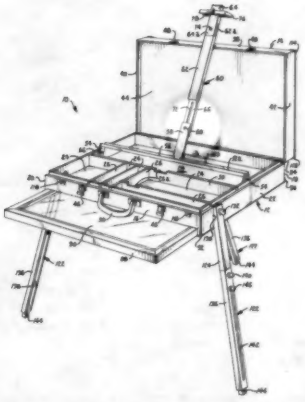
means retaining said bristles in said configuration, said mounting ends being secured in said retaining means and said retaining means being located at said second side; and

said bristles and said retaining means completely covering said slot and permitting a wire extending through said slot to be pulled longitudinally along said slot.

4,372,630
PORTABLE EASEL DEVICE

William F. Fuhri, R.R. 5, Box 94, Liberty, Mo. 64068

Filed Nov. 14, 1980, Ser. No. 206,947
Int. Cl.³ A47B *97/04*
U.S. Cl. 312—231 16 Claims



1. A portable easel arrangement comprising:

a carrying case having a lower section presenting a plurality of compartments for holding art supplies;

an upper section of the carrying case coupled with said lower section for hinged movement between an open position wherein said compartments are accessible and a closed position wherein the upper section covers the lower section;

a canvas rest mounted in said lower section for pivotal movement between a folded storage position wherein the canvas rest is contained in the lower section of the case and an extended position wherein the canvas rest presents a surface thereon for receiving the lower edge of a painting canvas;

an easel arm adapted for detachable connection to said canvas rest in generally upward extension therefrom to receive the back of a painting canvas resting on the canvas rest, said arm fitting in said carrying case for storage when detached from the canvas rest; and

means for detachably fastening a selected portion of said easel arm to said upper section in the open position of the latter to maintain said arm in a generally vertical orientation for receiving the back of a canvas resting on said canvas rest, said detachable fastening means holding said upper section and said canvas rest and easel arm rigidly in place in a configuration wherein said upper and lower

sections and said easel arm cooperate to form a rigid triangular structure for supporting the painting canvas.

4,372,631

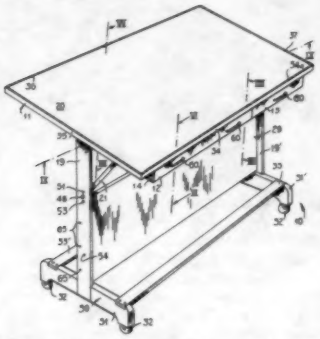
FOLDABLE DRAFTING TABLE WITH DRAWERS

Harry I. Leon, 924 Bowen St., NW., Atlanta, Ga. 30318

Filed Oct. 5, 1981, Ser. No. 308,146

Int. Cl.³ A47B *27/00*; A47F *5/12*

U.S. Cl. 312—231 **9 Claims**



1. A drafting table which comprises:

(a) a board;

(b) at least one pair of support arms which are attached to the underside of the board, the support arms being spaced apart from, and disposed generally parallel to, each other; and

(c) a drawer which is insertable between the pair of support arms; each support arm having first slot and key means cooperating with second slot and key means on the drawer for supporting the drawer beneath the board, even when the drawer is tilted at an angle of several degrees from the horizontal,

(d) said first slot and key means further comprises at least one pair of keys and a pair of stays, each stay protruding from one of the support arms on a side thereof to which one of the keys is connected; each stay and the key proximate thereto being spaced apart, the opposing walls thereof being disposed generally parallel to each other; and

(e) said second slot and key means further comprises a pair of slots formed in the sides of each drawer and segments of the drawer disposed between each slot and the proximate upper edge of the drawer, each key cooperating with a slot as at least one of said segments cooperates with a pair of opposing walls, so that drag forces between a key and the slot with which it cooperates are augmented by interaction between a segment and at least one of the opposing walls proximate thereto, thereby braking movement of the drawer under the force of gravity alone.

4,372,632

SLIDE INTERLOCK AND CABINET STABILIZER

Paul Y. Villa, Santa Clara, and Alvin D. Day, San Jose, both of Calif., assignors to Sperry Corporation, New York, N.Y.

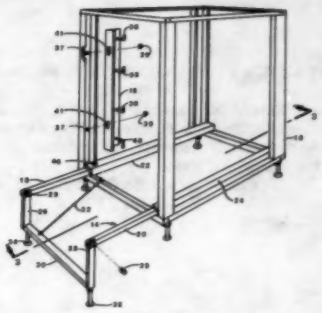
Filed Feb. 2, 1981, Ser. No. 230,580

Int. Cl.³ A47B *88/00*; E05B *65/46*

U.S. Cl. 312—311 **3 Claims**

1. A cabinet assembly comprising: a cabinet including a drawer movable between stored and other positions; vertically disposed interlock means slidably mounted to said cabinet and movable between raised and lowered positions; a brace locking peg and a chassis locking peg rigidly affixed to said interlock means; and horizontally disposed brace means slidably mounted to said cabinet, said brace means having a hole formed therein and being movable to an extended position for supporting said cabinet from tipping and to a stowed position for storage within the cabinet;

wherein said cabinet assembly is so constructed and arranged that in the situations where said brace means is at the stowed position or any position intermediate the stowed and extended positions, said brace locking peg overrides the brace means whereby said interlock means is held in said raised position and said chassis locking peg is disposed for locking said drawer in the stored position; where said brace means is moved to the extended position, said brace locking peg falls into said hole of the brace means so that said brace means is locked at the extended



position and said interlock means is moved to said lowered position whereby said chassis locking peg is disposed under the drawer and said drawer is unlocked for moving from said stored position; where said drawer is at said other position, said chassis locking peg is blocked by the drawer from being raised thereby preventing said interlock means from moving from said lowered position; and where the drawer is at said stored position and said interlock means is moved back to said raised position whereby said brace locking peg is lifted from said hole, said brace means is unlocked for moving from said extended position and said chassis locking peg is disposed for locking said drawer.

4,372,633

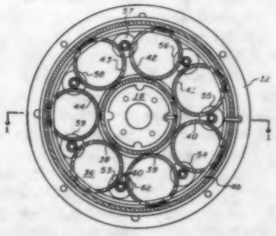
HIGH CURRENT TRANSFER ROLL RING ASSEMBLY

Terry S. Allen, and Peter E. Jacobson, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 17, 1981, Ser. No. 255,021

Int. Cl.³ H01R *39/28*

U.S. Cl. 339—5 M **13 Claims**



1. A full rotational freedom conductor assembly for conducting electrical energy between a pair of members relatively rotatable about a common axis thereof comprising

(a) first and second circular, coplanar electrically conductive rings, one thereof being disposed on one of said members and the other thereof being disposed on the other said

members, providing a relatively large radial gap therebetween;

(b) a plurality of resilient, filamentary, coplanar conductive circular loops disposed in said gap in rolling contact with said rings for providing electrical conductivity between said pair of rings;

(c) loop separating means disposed in rolling contact with said circular loops and arranged to prevent physical contact between adjacent circular loops;

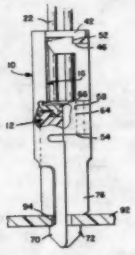
(d) retaining means disposed on at least one of said members and in rolling contact with said loop separating means for holding said loop separating means in contact with said circular loops.

4,372,634

TILT LATCH ZERO INSERTION FORCE CONNECTOR ASSEMBLY

Leon T. Ritchie, Mechanicsburg; Clair W. Snyder, Jr., York, both of Pa.; Thurston H. Toeppen, Poughkeepsie, N.Y., and John A. Woratyla, Camphill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1981, Ser. No. 240,524
Int. Cl.³ H01R 9/09
U.S. Cl. 339—17 C 8 Claims



8. In combination with a printed circuit board having an array of conductive holes, an electrical connector assembly for making zero insertion force connection with said circuit board, said electrical connector assembly comprising:

a pair of identical elongated housing members of rigid insulative material each having a plurality of terminal passageways extending from a rear end through said housing member to open on a front mating face, each said passageway being fully enclosed adjacent the mating face and outwardly open to form a channel shape at the rear end remote from said mating face;

a like plurality of terminals each mounted in a respective one of said passageways, each terminal having a forwardly directed cantilever beam extending from said mating face and an insulation displacing conductor engaging rear end portion lying in and accessible from said channel shape at said rear end; and

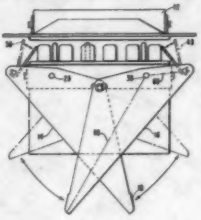
a pair of hermaphroditic cover members each having means engaging a respective one of said housing members to form a subassembly, latching means detachably securing said cover members together, and mounting legs receivable in mounting apertures in said circuit board whereby said subassemblies are initially individually engaged at a tilted angle with respect to the plane of said circuit board with the beams of the terminals extending into said conductive holes making only incidental contact therewith and the subassemblies rotated with respect to one another and to said circuit board to bring said cover members into locking engagement while bringing the beams into engagement with the walls of the respective conductive holes.

4,372,635

MULTIPLE CONNECTOR PLUG REMOVAL DEVICE

John E. Waldschmidt, New Market, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 5, 1981, Ser. No. 240,653
Int. Cl.³ H01R 13/62
U.S. Cl. 339—45 M 6 Claims



1. A multiple connector plug removal device for removing a plug from a complementary plug, comprising:

a frame member encompassing the removable plug adjacent the face of the plug and secured to said plug;

a pair of one-piece, U-shaped levers straddling the frame and plug and disposed in generally mirror image relation to each other, each lever including opposite arms and a bight handle portion, the opposite arms being independently pivotally secured to the opposite sides of the frame at fulcrum points spaced inwardly from the ends of the frame a minor portion of the length of the frame so that with movement of the levers from a plug-inserted-position to a plug-removed-position the levers function as first class levers with the distal ends of the arms opposite the handle portions moving in an arc toward said complementary plug and with the handles moving in a much larger arc away from the complementary plug;

means pivotally securing each arm on one side of the frame to the other arm on the same side of the frame at a generally centered location along the length of the frame to compel movement of the levers concurrently; and

a pusher member pivotally secured along one of its edges by each lever at the lever distal end and located beyond the end of the plug, each pusher member being biased to urge its free edge inwardly, the free edges of said pusher members abutting structure at the ends of said complementary plug when the levers are in their plug-inserted-positions.

4,372,636

BATTERY CONNECTOR

Raymond A. Dufresne, Phoenix, Ariz., assignor to Terry R. Eberts; Herbert E. Haynes, Jr. and Matthew L. Ajeman, all of Phoenix, Ariz., S

Continuation-in-part of Ser. No. 124,979, Feb. 27, 1980, and Ser. No. 135,348, Mar. 31, 1980, abandoned. This application Oct. 14, 1980, Ser. No. 196,868
Int. Cl.³ H01R 11/24
U.S. Cl. 339—237 6 Claims

1. A connector for direct attachment of the conductive strands of a battery cable to the terminal post of an electric storage battery comprising:

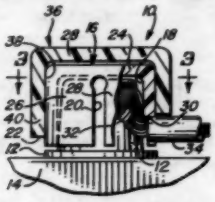
(a) connector body means having a bore for axially receiving the terminal post of the electric storage battery;

(b) means formed in said connector body means through which the conductive strands of the battery cable are introducable into the bore thereof for bearing engagement with the peripheral surface of the terminal post of the electric storage battery when the terminal post is axially received in the bore of said connector body means; and

(c) said connector body means including means for exerting a pressurizing force to provide a conductive contact between the conductive strands of the battery cable and the

terminal post when the conductive strands of the battery cable are introduced into the bore of said connector body means and the terminal post is axially received therein, said connector body means comprising:

(i) a clamping cap having the bore of said connector body means formed therein with the bore being blind, said clamping cap including a top from which at least a pair of resiliently deflectable legs extend with the legs configured to substantially circumscribe the blind bore formed in said clamping cap;



(ii) said clamping cap having a notch formed centrally in the extending edge of one of the pair of resilient deflectable legs thereof with said notch being said means through which the conductive strands of the battery cable are introducable; and

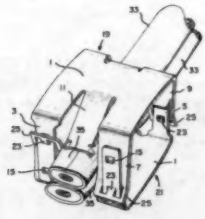
(iii) said clamping cap having its blind bore sized so that when the conductive strands of the battery cable are introduced therein an interference fit is provided for the axial reception of the terminal post of the electric storage battery in the blind bore of said clamping cap.

4,372,637

BOND SHIELD TERMINAL

David Lane, Greensboro; Mervin Woodward, Winston-Salem, and Jerry B. Kilpatrick, Greensboro, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 10, 1981, Ser. No. 252,769
Int. Cl.³ H01R 4/48
U.S. Cl. 339—244 R **18 Claims**



1. In a bond shield terminal formed from a pair of hermaphroditic interconnectable elements, each element comprising:

(a) a substantially flat base portion having four corner regions,

(b) a pair of arms extending from adjacent ones of said corners normal to said base portion, each of said arms having aperture means formed therein,

(c) a pair of legs extending from the other of said corners normal to said base portion, each of said legs having receiving means for receiving a said arm and latching means within said receiving means for entering a said aperture means in said received arm, and

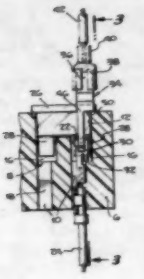
(d) spring arm means depending from said base portion in the direction of said arms and legs for securing a wire.

4,372,638

ELECTRICAL CONNECTOR FOR TAPPING INTO A FUSE BLOCK

Lawrence J. Sohler, 15848 Moorpark St., Encino, Calif. 91436

Filed Feb. 12, 1981, Ser. No. 233,977
Int. Cl.³ H01H 85/46; H01R 11/00, 13/115
U.S. Cl. 339—273 F **7 Claims**



1. An elecrical connector for use with a fuse block having a recess defined by spaced opposed side walls, a pair of fuse blade contact elements in said recess adjacent said side walls and a fuse body in the upper portion of said recess above said pair of fuse contacts, said fuse body having a contact blade depending therefrom and removably received between said fuse blade contact elements, comprising:

an electrically conductive clip having an upper portion adapted to connect with an electrical connector,

a pair of legs extending downwardly from saidupper portion and having inner faces comprising elecrical contact surfaces,

said legs being spaced and of a length to straddle said fuse body and said spring contact elements,

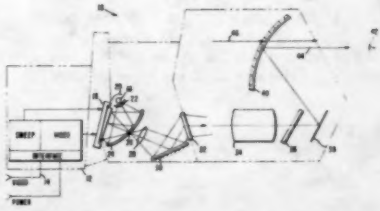
and said legs having at least portions thereof with sufficient lateral dimension to wedge between their respective spring contact elements and the side walls of said recess, causing the legs to grip said fuse blade contact elements and biasing the fuse blade elements to grip the fuse blade.

4,372,639

DIRECTIONAL DIFFUSING SCREEN

Kenneth C. Johnson, El Cerrito, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 3, 1981, Ser. No. 270,159
Int. Cl.³ G02B 5/32
U.S. Cl. 350—3.7 **5 Claims**



1. An optical system comprising:

an information carrying liquid crystal screen at a first image focal plane, means for driving said liquid crystal screen to provide real-time information;

means for illuminating said information carrying liquid crystal screen with substantially monochromatic light;

a holographic optical element at a second image focal plane;

lens means positioned between said information carrying liquid crystal screen and said holographic optical element for projecting substantially monochromatic light carrying the real-time information carried by said information carrying liquid crystal screen at said first image focal plane onto said holographic optical element at said second focal plane, said projection means providing light rays from said real-time information containing liquid crystal screen to said holographic optical element; and

diffraction means in said holographic optical element for diffracting a substantial portion of the incoming substantially monochromatic light to a viewing pupil by means of which a ray of light incident on any particular point on said holographic optical element from the lens means is redirected and diffused into a predetermined directional range intercepting a designated pupil region in space, whereby the light diffracted from said incident beam by said holographic optical element is substantially directed within and illuminates said pupil region with selected intensity distribution so that the information at said information carrying liquid crystal screen is viewable at said viewing pupil as diffused information with substantially uniform illumination across said pupil.

4,372,640

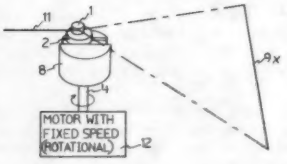
LINE MAKER WITH LASER SOURCE

Eugene F. LaCroix, 5611-240th SE., Woodinville, Wash. 98072

Filed Mar. 23, 1981, Ser. No. 246,389

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.3 **3 Claims**



1. Means for drawing a visually continuous line upon a regularly replaced object such as a log or the like being cut into lumber comprising:

a fixed laser source an appropriate distance from the desired line display, a cylindrical lens mounted between the laser source and the desired line display, said cylindrical lens mounted to a rotating body with its axis perpendicular to the desired line display, and parallel to but non-colinear with the axis of rotation such that it oscillates through the laser beam to form a line of the desired length.

4,372,641

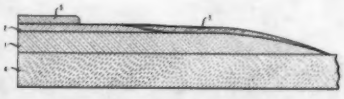
OPTICAL WAVEGUIDE TERMINATION

Leo F. Johnson, Bedminster, and LeGrand G. Van Uitert, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1980, Ser. No. 163,789

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.12 **13 Claims**



1. Optical communications device comprising a substrate-supported waveguide which is elongated in a direction of light propagation and which comprises a central portion in which index of refraction decreases by less than 1 percent in directions away from a center line of said central portion, said device being characterized in that a portion of said waveguide, here designated as an absorbing portion, comprises absorbing centers which absorb optical radiation at one or several wavelengths, said absorbing centers being present in said portion so as to result in gradually increasing interaction between said absorbing centers and light propagating in said direction and said absorbing centers being present in said portion in an amount sufficient for attenuation of said radiation by at least 30 decibel over a distance which is less than or equal to 10 centimeter and greater than or equal to 0.1 millimeter.

4,372,642

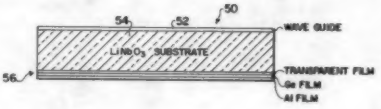
MULTIPLE THIN FILM ABSORPTION OF REFLECTED SUBSTRATE MODES IN WAVEGUIDE SYSTEM

Arnold H. Singer, and Ronald T. Holm, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1980, Ser. No. 210,188

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.12 **21 Claims**



12. An optical waveguide system with reduced substrate reflections comprising:

a substrate;

a thin-film optical waveguide on the frontside of the substrate for carrying light therethrough; and

an absorbing antireflective coating on the backside of the substrate comprising:

a first layer of transparent material;

a second layer of material being moderately lossy; and

a third layer of material being highly lossy;

whereby light of substantially a single wavelength having leaked into the substrate and incident to the backside thereof over a broad range of angles is substantially absorbed with minimal reflection.

4,372,643

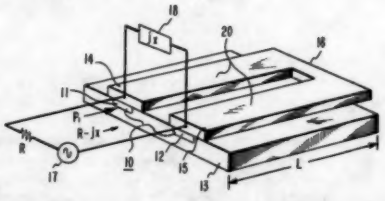
STANDING-WAVE, VELOCITY-MATCHED GATE

Pao-Lo P. Liu, Eatontown, and Enrique A. Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 23, 1980, Ser. No. 161,761

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.14 **11 Claims**



1. In combination, apparatus including:

a pair of coupled optical wavepaths (**11, 12** and **60, 61**) and, means (**20, 70**), supportive of travelling electrical waves, for locally modulating the coupling between said wavepaths;

Characterized in that said travelling wave means is terminated to produce a standing wave therealong.

4,372,644

STRIP DIODE LASER WITH REACTANCE FREE FIBER OUTPUT

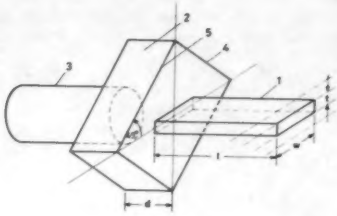
Hans-Georg Unger, Brunswick, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,241

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945466

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 7 Claims



1. In an arrangement including a strip diode laser having an optical fiber coupled to its output for transmission of the output signals of said laser the improvement comprising means, inserted between said output of said laser and input of said optical fiber, for converting the linearly polarized wave at said output of said laser to a circularly polarized wave at said input of said optical fiber.

4,372,645

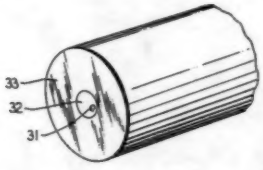
OPTICAL FIBER WITH ENHANCED MODE COUPLING

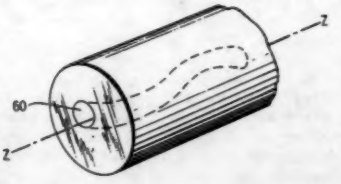
Stewart E. Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 885,445, Mar. 10, 1978, Pat. No. 4,308,045. This application Aug. 10, 1981, Ser. No. 291,311

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.30 4 Claims





1. A multimode optical fiber comprising:

an inner core region surrounded by an outer cladding region of lower refractive index;

CHARACTERIZED IN THAT:

said fiber includes a third region whose refractive index is different than that of said core region;

and in that said third region intercepts a portion of the optical wave field guided by said core and meanders about the longitudinal axis of said fiber in a manner to cause mode coupling.

4. A multimode optical fiber comprising:

an inner core region surrounded by an outer cladding of lower refractive index;

CHARACTERIZED IN THAT

said core region meanders about the longitudinal axis of said fiber such that the spatial variation of said region in the longitudinal direction has significant spectral components at the beat wavelengths of the modes guided by said multimode fiber.

4,372,646

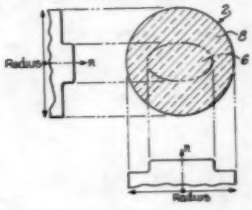
BIREFRINGENT ELECTROMAGNETIC TRANSMISSION LINE THAT PRESERVES THE STATE OF POLARIZED RADIATION PROPAGATING THEREIN

Virgil H. Strahan, Orange; Kenneth A. James, Corona del Mar, and William H. Quick, La Habra Heights, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 31, 1980, Ser. No. 174,088

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.31 5 Claims



1. The structure for a geometrically configured birefringent optical waveguide comprising:

a cylindrically symmetrical rod of optically transmissive material, and

an index of refraction altered region of oblong cross-section comprising implanted ions selectively located within said rod to cause the respective profiles of the indices of refraction along two orthogonal axes of said rod to be different from one another.

4,372,647

SINGLE MODE OPTICAL FIBERS

Katsunari Okamoto; Takao Edahiro, both of Mito; Akio Kawana, Komae, and Tetsuo Miya, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,704

Claims priority, application Japan, Oct. 8, 1979, 54-130452; Jul. 14, 1980, 55-95956

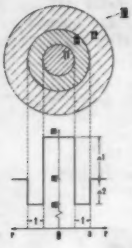
Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.33 7 Claims

1. A single mode oritical fiber comprising core having a refractive index of n1, a cladding surrounding said core and having a refractive index of n2 and an intermediate layer interposed between said core and cladding and having a refractive index of n3, wherein said refractive indices n1, n2 and n3 and selected to satify the following relations.

$$0.5<\Delta 1<1.5$$

$-0.3>\Delta 2>-1.0$



where

$$\Delta 1 = \frac{n1 - n2}{n1} \times 100\% \text{ and } \Delta 2 = \frac{n3 - n2}{n2} \times 100\%$$

4,372,648

OPTICAL FIBRES

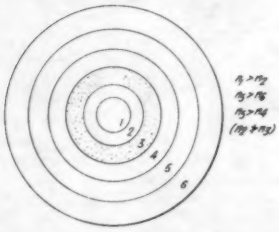
Philip W. Black, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,944

Claims priority, application United Kingdom, Oct. 29, 1979, 7937477

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.33 **15 Claims**



1. An optical fibre having an inner waveguiding structure of irradiation resistant material consisting of a transparent optical core surrounded by a lower refractive index optical cladding, which inner waveguiding structure is separated, by an intermediate layer of irradiation sensitive material rendered optically absorbing by irradiation, from an outer waveguiding structure also of irradiation resistant material consisting of an annular transparent optical core sandwiched between lower refractive index transparent inner and outer cladding layers of lower refractive index.

4,372,649

EXTENDED AREA DIFFRACTIVE SUBTRACTIVE COLOR FILTERS

Truman F. Kellie, Lakeland, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 22, 1978, Ser. No. 908,242

Int. Cl.³ G02B 5/18

U.S. Cl. 350—162 SF **9 Claims**

1. A method for forming a subtractive color filter suitable for selective attenuation of predetermined wavelengths comprising

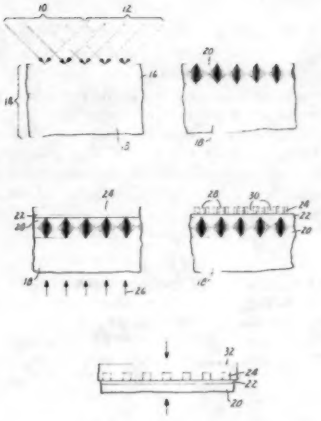
(a) directing a pair of mutually coherent beams of radiation having a substantially constant intensity over a given area onto a surface of a photographic medium to form a latent image of a standing wave interference fringe field pattern in which the peak image intensity is substantially constant across an area greater than a square of 50 cm^2,

(b) processing said medium to form a permanent image of said field pattern as regions of uniformly varying optical density,

(c) applying a transparent barrier layer to the exposed surface of said medium,

(d) applying a positive photoresist material onto the exposed surface of the barrier layer to form thereon a photoresist layer having a substantially uniform thickness in the range of 0.50–2.00 $\mu m \pm 0.05$ μm,

(e) directing radiation through the processed medium to form in the photoresist layer a latent image of the optical density image in said medium, under controlled time and exposure conditions such that the total exposure in the photoresist layer results in an aspect ratio in exposed regions in the photoresist layer corresponding to adjacent regions of said optical density image ranging between 0.25 and 0.75,



(f) processing said photoresist layer to remove substantially all of the exposed portions corresponding to the transmissive portions of said optical density image, forming therein a surface relief pattern, having a succession of peaks and valleys, the distance therebetween being substantially equal to the thickness of the layer, and

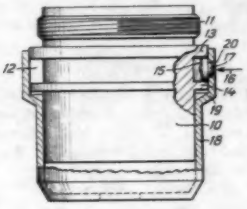
(g) replicating said pattern into the surface of a polymeric web to form on a surface thereof an optically detectable, width controlled periodic surface relief pattern corresponding to said interference fringe field pattern and extending uniformly and free of discontinuities over a square area greater than 50 cm^2.

9. A subtractive color filter according to the method of claim **1**.

4,372,650
MOUNTING FOR MICROSCOPE LENS

Robert Listfeld, Greifenstein-ulm, and Reinhold Bender, Selms, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE80/00004, § 371 Date Sep. 19, 1980, § 102(e) Date Sep. 18, 1980, PCT Pub. No. WO80/01512, PCT Pub. Date Jul. 24, 1980
PCT Filed Jan. 12, 1980, Ser. No. 207,970
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 7901401[U]
Int. Cl.³ G02B 7/02; F16L 39/00
U.S. Cl. 350—252 5 Claims

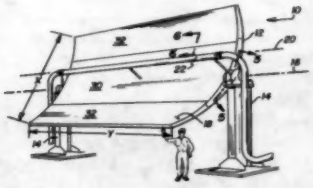


1. A microscope objective mount comprising:
a mount body with thread means for screwing said mount onto a microscope, said mount body having an annular groove therearound;
a tubular sleeve surrounding said mount body and covering substantially the entire length of said mount body when said mount body is screwed onto a microscope, said sleeve having a hole therethrough; and
detent means engaging said groove on said mount body and said hole through said sleeve for releasably and rotatably securing said sleeve on said mount body, said detent means being releasable only with the aid of an opening tool through said hole;
whereby said sleeve is freely rotatable around said mount body and cannot be removed from said mount body without an opening tool, and said mount cannot be unscrewed from said microscope with said sleeve thereon.

4,372,651
SOLAR COLLECTOR MODULE

Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Division of Ser. No. 86,314, Oct. 19, 1979, Pat. No. 4,297,003. This application Jun. 22, 1981, Ser. No. 275,638
Int. Cl.³ G02B 7/18, 5/10
U.S. Cl. 350—292 3 Claims

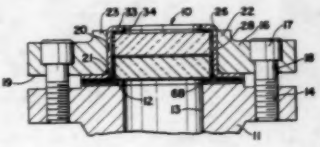


1. A solar collector comprising: at least two elongated modules having a reflective surface on the front sides thereof wherein the reflective surfaces of said modules conform to a particular reflective shape; connector means comprising channel members fastened to the abutting edges of each of said modules adjacent the connection point and extending the length thereof; a connector extending into the interior of said channel members and being fastened to each of said modules by fasteners.

4,372,652
LAMINATED GAGE GLASS ASSEMBLY

Robert A. Pontefract, Chelmsford, Mass., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 53,102, Jun. 28, 1979, abandoned. This application Dec. 2, 1980, Ser. No. 212,323
Int. Cl.³ G02B 5/00; G01F 23/02; G02B 7/00
U.S. Cl. 350—319 21 Claims

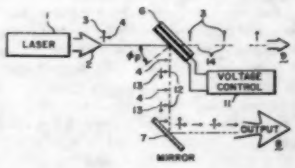


1. A lens assembly for a sight glass comprising a ferrule, said ferrule having an axially extending sidewall with an outwardly extending flange at one end and an inwardly extending flange at the other end, a first lens in said ferrule having a first side adjacent said inwardly extending flange, a second lens in said ferrule having a first side adjacent said outwardly extending flange, the opposite sides of said lenses being adjacent each other, and a sheet of transparent flexible plastic material extending between said lenses, between the outer periphery of said second lens and said ferrule sidewall and extending along the outer side of said outwardly extending flange.

4,372,653
POLARIZING BEAM SPLITTING PHASE TRANSITION OPTICAL MODULATOR

John C. Wert, III, 3101 Kemp Rd., Dayton, Ohio 45431

Filed Dec. 12, 1978, Ser. No. 968,875
Int. Cl.³ G02F 1/19; G02B 5/30
U.S. Cl. 350—385 2 Claims



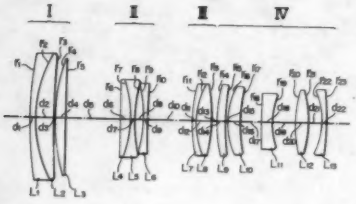
1. A polarizing modulator for altering the polarization of the reflected portion of an unpolarized incident luminous energy beam striking said modulator, comprising:
an optical element having a substantially flat incident surface, and fabricated with a substrate which is substantially transparent at the wavelength of said luminous energy beam and has deposited thereupon a thin film of transition material from the group consisting of VO, VO_2, VO_2O_3, V_3O_5, V_4O_7, V_5O_9, V_6O_{11}, V_7O_{13}, V_8O_{15}, Ti_2O_3, Ti_4O_7, NbO_2, $FeSi_2$, VO_2NbO_2, $V_{1-x}Mo_xO_2$, VO_2-TiO_2, V_2O_3-Ti_2O_3, $V_{1-x}Ge_xO_2$, $V_{1-x}Nb_xO_2$, $V_{1-x}Cr_xO_2$, $(Cr_xV_{1-x})_2O_3$ and $V_{1-x}Ti_xO_2$;
said flat surface of the optical element oriented at Brewster's angle with respect to said incident unpolarized luminous energy beam, where said Brewster's angle is a constant defined by the material forming the exterior of said flat surface; and

a means for stimulating said transitional material between reflective and transmissive states.

4,372,654
TELEPHOTO ZOOM LENS

Yoshisato Fujioka, Higashikurume, and Atsushi Kawamura, Yokosuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 11, 1981, Ser. No. 262,652
Claims priority, application Japan, May 15, 1980, 55-64636
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—427 4 Claims



1. A telephoto zoom lens comprising a variable magnification system including a first group which does not move during a zooming operation, but moves only during a focussing operation and generally having a positive refractive power and serving as a focussing group, a second group generally having a negative refractive power to serve as a variator lens group and disposed for movement along an optical axis during a zooming operation, the second group principally utilized to convert a focal length, and a third group generally having a positive refractive power to serve as a compensator lens group, the third group being disposed for movement along the optical axis during a zooming operation to maintain an image plane at a given location as the latter tends to shift with the movement of the second group, the first to the third groups being sequentially disposed in the sequence named as viewed from an object side, and a relay lens system formed by a fourth group which is disposed on an image side of the variable magnification system and which remains stationary during a focussing and a zooming operation; the first group including a composite converging lens system, formed by a combination of a negative and a positive or a positive and a negative single lens, and a positive single lens, all disposed in the sequence named as viewed from the object side, the second group including a negative lens, formed by a positive and a negative lens joined together, and a negative single lens, all disposed in the sequence named as viewed from the object side, the third group including a positive lens formed by a negative and a positive lens joined together, and the fourth group including a pair of positive lenses having their surfaces of high curvature directed toward the object side, a negative lens having its surface of a high curvature directed toward the image side, a positive single lens, and a negative lens having its surface of high curvature directed toward the object side, all disposed in the sequence named as viewed from the object side toward the image side, and wherein the individual lenses satisfy the following requirements:

$$0.8 < \frac{f_1}{f_4} < 1.5 \quad (1)$$

$$0.8 < \left|\frac{r_8}{r_9}\right| < 1.5 \quad (2)$$

$$0.7 < \frac{r_{12}}{n_7 - n_8} \cdot \frac{1}{f_3} < 3 \quad (3)$$

-continued

$$0.1 < \frac{r_{19}}{f_4} < 0.5 \quad (4)$$

$$1 < \frac{r_{21}}{r_{22}} < 2 \quad (5)$$

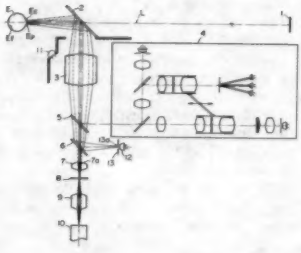
$$n_9 < 1.68, \nu_9 > 50$$
$$n_{10} < 1.68, \nu_{10} > 50 \quad (6)$$

where f_i represents the composite focal length of an i-th group, r_i the radius of curvature of an i-th surface, d_i the axial thickness or air separation between an i-th and an (i+1)-th surface, n_i the refractive index of an i-th lens with respect to d-line of the spectrum and ν_i the Abbe's number of an i-th lens.

4,372,655
AUTOMATIC EYE-REFRACTOMETER

Isao Matsumura, Yokosuka; Yasuyuki Ishikawa, Kawaguchi; Shigeo Maruyama, Kawasaki; Reiji Hirano, and Yoshimi Kohayakawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1979, Ser. No. 75,115
Claims priority, application Japan, Sep. 20, 1978, 53-115647
Int. Cl.³ A61B *3/14, 3/10*
U.S. Cl. 351—206 7 Claims



1. An apparatus for automatically measuring the refractive power of an eye, comprising:

a diopter measuring system for directing radiant energy to the fundus of an eye to be examined, detecting the focus of the radiant energy reflected upon the fundus of the eye and operating on the signal stream of focus detection;

means for converting said signal stream into a video signal which forms a character pattern;

a video camera for photographing the front part of the eye; and

a video display device electrically connected with said converting means and with said video camera for receiving said video signal and displaying said character pattern and for displaying the front part of the eye.

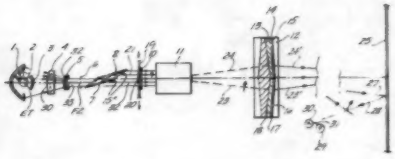
4,372,656
HIGH EFFICIENCY OPTICAL PROJECTOR FOR 3D MOTION PICTURES

Alvin M. Marks, 166-35 9th Ave., and Mortimer Marks, 166-25 Cryders La., both of Whitestone, N.Y. 11357

Filed May 15, 1981, Ser. No. 264,055
Int. Cl.³ G03B *35/00*
U.S. Cl. 352—57 9 Claims

1. A motion picture projection system, comprising a light source, a first reflector, a surface on said first reflector, said surface being an ellipse of revolution with a first focus and a second focus, said focii being coincident with said axis of revolution, a light source located at said first focus, a first lens,

said first lens having a first spherical surface with its center of curvature at said second focus, and a first aspheric surface; said second lens having a second spherical surface with its center of curvature also at said second focus, and a second aspheric surface, a first rectangular aperture plate, a multilayer sheet polarizer at Brewster's angle to said axis, at least one surface having a high index layer capable of polarizing light by reflection and transmission, said reflected polarized light rays and said transmitted polarized light rays being polarized with their planes of polarization at right angles, a second reflector, said second reflector redirecting said reflected polarized light rays parallel and contiguous to said transmitted polarized light rays, a conventional film strip having a succession of image areas, a standard second aperture for said images, each said image area having a black bar centered in said image area, right and left stereo images in areas on each side of said black bar within said second aperture, said transmitted polarized rays impinging on



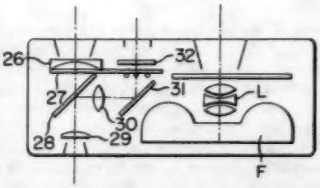
one of said stereo image areas, and said reflected polarized rays impinging on the other said stereo image area, a projection lens, a first prism and a second prism, a first polarizer and a second polarizer, said first polarizer and said first prism in combination, and said second polarizer and said second prism in combination, said combined polarizer-prisms bending and further polarizing said rays, a metallized reflecting screen for reflecting said stereo images as polarized rays reflecting the image rays from said screen, a polarized viewer comprising a frame, right eye and left eye aperture mountings on said frame, polarized filter sheets having horizontal and vertical planes of polarization mounted in said right eye and left eye apertures respectively whereby the right eye image is transmitted only by said right polarized filter sheet, and said left eye image is transmitted only by said left eye polarized filter sheet, and whereby the light efficiency of said system is at least doubled, compared to said projector system without said multilayer polarizers and said second reflector.

4,372,657

DEVICE FOR INDICATING PHOTOGRAPHIC EXPOSURE CONDITIONS

Hiroshi Iwata, Nara, and Tetsuo Yamaoka, Osaka, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Jun. 10, 1981, Ser. No. 272,168
Claims priority, application Japan, Jun. 17, 1980, 55-82649
Int. Cl.³ G03B *17/20, 7/26, 15/05, 13/02*
U.S. Cl. 354—53 **5 Claims**



1. A view finder for a camera including means for providing a warning of unsatisfactory exposure conditions, comprising:

a window through which a subject may be viewed, said window comprising an electro-optical element having a transparent state and an opaque state, the state of said window being determined by an electrical control signal applied thereto;

means responsive to a plurality of exposure-affecting conditions of said camera for setting said electrical control signal at a first value when all of said conditions are satisfactory and at a second value when any one of said conditions is unsatisfactory; and

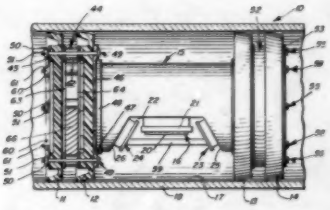
a driving circuit connected to said window and responsive to said electrical control signal for (i) rendering the entire window transparent when said electrical control signal has said first value, and (ii) rendering the entire window continuously or intermittently opaque to block the view of said subject when said electrical control signal has said second value.

4,372,658

PIPELINE INSPECTION APPARATUS

Donald T. O'Connor, Barrington Hills; Donald E. Lorenzi, Des Plaines; John J. Flaherty, Elk Grove Village, and Edward Schaefer, Bellwood, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Continuation of Ser. No. 155,512, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 881,148, Feb. 27, 1978, Pat. No. 4,249,810. This application Feb. 10, 1982, Ser. No. 347,541
Int. Cl.³ G03B *37/00*
U.S. Cl. 354—63 **6 Claims**



1. In pipe inspection apparatus, a device arranged to be moved down through a vertically extending pipe section and thence into a horizontal pipe section for longitudinal horizontal movement therewithin, said device comprising photographic camera means including means defining a rectangular image area, film storage and transport means arranged for feeding film through said image area and optical means for projecting an image to said image area, said optical means being arranged to project said image along a viewing axis from an internal surface area of the pipe with said viewing axis being normal to the axis of said pipe and with a generally rectangular image being produced in said image area which corresponds to a generally rectangular internal surface area of the pipe and which has length and width dimensions respectively corresponding to the axial length and arcuate width dimensions of said internal surface area, illumination means for illuminating said internal surface area of the pipe, operating means for operating said film storage and transport means and said illumination means during movement of said device along the pipe for recording on the film a plurality of images corresponding to axially spaced generally rectangular surface areas of the pipe, said illumination means being spaced axially from said viewing axis and being arranged to project light toward said internal surface area of the pipe in a direction at a substantially uniform acute angle to the axis of the pipe and with substantially uniform intensity, the relationship between the direction of the light and the surface of the pipe being substantially uniform throughout all of said internal surface area of the pipe such that shadows are produced across recesses in said internal surface area of the pipe and such that there is a substantially uniform relationship between the size of the images of said

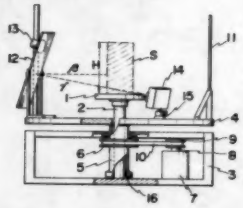
shadows and the size of the corresponding recesses in said internal surface area, engagement means including at least two axially spaced cup members defining resilient annular flanges in engagement with axially spaced portions of the inside surface of the pipe, a central housing section supporting said camera and illumination means therewithin, a pair of cup member support structures secured to opposite ends of said central housing section for support of said central housing section from said cup members, said viewing axis being approximately mid-way between said cup member support structures, and weight means operative under the force of gravity to urge said device toward a certain angular position when moving longitudinally through a horizontal pipe section and to place said viewing axis at a predetermined angular position relative to the pipe.

4,372,659

APPARATUS FOR TAKING A CONTINUOUS PHOTOGRAPH OF THE EXTERIOR OF AN ARTICLE

Tadshiro Ogawa, Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 285,276
Int. Cl.³ G03B *29/00, 15/06*
U.S. Cl. 354—80 **5 Claims**



1. An apparatus for taking a single, continuous photograph of the exterior of an article comprising:

a central disk adapted for placement of said article thereupon;

an outer disk coaxial with said central disk, the positions of said central disk and said outer disk being rotatable relative to one another; and

a slit camera positioned on said outer disk for taking said photograph, said slit camera having an effective line of sight which is essentially perpendicular to the exterior of said article, said article and said camera thereby being rotatable relative to one another;

wherein the velocity and direction of the film fed behind the slit in said slit camera are porportional to the speed and direction of rotation of said object relative to said camera.

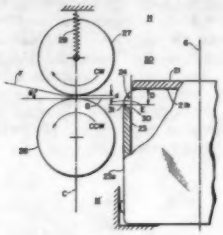
4,372,660

FILM UNIT CONTAINING PACK

Yoshio Hara, Minami-ashigara, and Tadayoshi Shibata, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1981, Ser. No. 258,493
Claims priority, application Japan, Apr. 28, 1980, 55-56427
Int. Cl.³ G03B *17/26, 17/52*
U.S. Cl. 354—180 **3 Claims**

1. A film unit containing pack for holding a plurality of film units piled one on another for use with an instant camera in which each of said film units once exposed is fed between a pair of developing rollers including a master roller mounted on a fixed axis and a slave roller spring biased toward said master roller, each roller having an outside diameter in a range of substantially 6 to 12 mm, each of said film units having a processing solution holding container adapted to be burst by said developing roller means, and said camera and said pack being adapted such that processing solution contained in said container is spread over a predetermined image forming region of said film units while said film units is discharged out of said camera by said developing rollers with a discharging angle of 10° to 20° towards a front of said camera, the improvement comprising; said pack having a lower edge of an outlet through which said film unit is pulled out of said pack, said lower edge



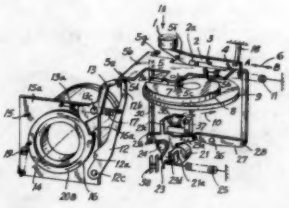
being located relative to the film unit opposite said image forming region thereon, formed to have a level difference in a range of −0.15 to +0.35 mm with respect to the level of an outer wall of said master roller which is closest to an outer wall of said slave roller, and said master roller located on the same side of said film unit as said lower edge.

4,372,661

TENSIONING AND RELEASING ASSEMBLY FOR A CAMERA SHUTTER

Karl-Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG, Bunde, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,041
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032976
Int. Cl.³ G03B *9/64, 17/42*
U.S. Cl. 354—204 **11 Claims**



1. An assembly for tensioning a camera shutter in a camera having a lens and shutter assembly moveable along the axis of the camera lens, comprising:

shutter activation means including a tensioning slide mounted within the camera body for selective displacement in a first direction and an opposed second direction transverse to the axis of the lens;

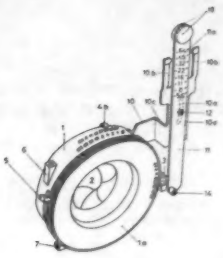
tensioning means mounted within the camera body for tensioning the shutter in response to displacement of the activation means in a tensioning direction; and

locking means mounted within the camera body and operatively engaged to the shutter assembly for holding the shutter in a tensioned position and for releasing the shutter in response to displacement of the activation means in a direction opposite to the tensioning direction.

4,372,662
DIAPHRAGM SETTING DEVICE FOR PHOTOGRAPHIC CAMERA

Franz Starp, Mittlere Steige 36, and Dieter Rittmann, Calwerstrasse 53, both of 7547 Wildbad 5, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,970
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034630; Jan. 17, 1981, 3101388
Int. Cl.³ G03B 9/02
U.S. Cl. 354—273 21 Claims

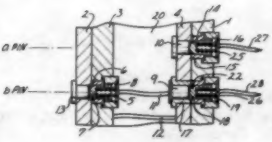


1. Diaphragm setting device arrangement for a photographic camera comprising a lens shutter housing having a displaceable diaphragm adjusting ring adapted for selectively adjusting the diaphragm of the shutter thereof in conjunction with a setting scale and a counterpart indicator mark, and a diaphragm setting device including an elongate carrier mounted on the outer periphery of the shutter housing and extending substantially tangentially relative to the shutter housing, and a setting slide slidably guided on and movable relative to the carrier and disposed in operational engagement with the diaphragm adjusting ring, the setting slide being slidably guided on the carrier by means of a pin and slot connection and having a slide end portion articulatedly connected directly to the diaphragm adjusting ring by means of an articulated connection.

4,372,663
REAR APERTURE CONVERTER

Fumio Oshima, Shiki, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 285,917
Claims priority, application Japan, Jul. 31, 1980, 55-108650[U]
Int. Cl.³ G03B 17/14, 7/20; G02B 7/02
U.S. Cl. 354—286 2 Claims



1. In a photographic camera having an interchangeable lens assembly with a lens mount and a camera body with a body mount engageable with the lens mount, a source of binary signals in the lens assembly having at least two bits representative of a lens characteristic, and means in the camera body for receiving the binary information, a rear aperture converter comprising:

a first mount engageable with the lens mount;

a second mount engageable with the body mount;

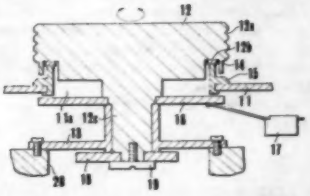
means for transmitting from the first mount to the second mount without change one bit of the binary information; and

means for transmitting from the first mount to the second mount the other bit of the binary information in inverted form.

4,372,664
MOISTURE- AND DUST-PROOF DEVICE FOR ROTATING OPERATION PART OF CAMERA

Masami Shimizu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,206
Claims priority, application Japan, Nov. 19, 1980, 55-165502[U]
Int. Cl.³ G03B 17/02, 17/08
U.S. Cl. 354—288 3 Claims

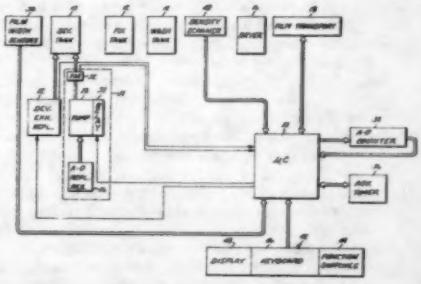


1. A moisture- and dust-proof device for a camera, comprising a ring-shaped visco-elastic member which has a receiving seat formed at one end thereof for receiving an operation member of said camera and which has another end secured to the periphery of an operation member inserting hole provided in the external wall of said camera, said one end of said ring-shaped member being disposed within a peripheral grooved part of said operation member; and a washer which is made of a resin material having a low coefficient of friction and is interposed between the inner side of the peripheral grooved part of said operation member and said receiving seat of said ring-shaped member.

4,372,665
AUTOMATIC VARIABLE-QUANTITY/FIXED-TIME ANTI-OXIDATION REPLENISHER CONTROL SYSTEM

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 16, 1981, Ser. No. 321,392
Int. Cl.³ G03D 3/06; G05D 11/00
U.S. Cl. 354—298 7 Claims



1. A method of providing replenishment to processor fluid in a processor photosensitive material, the method comprising:

(a) commencing a predetermined time interval;

(b) providing exhaustion replenishment during the time interval as a function of the use of processor fluid;

(c) providing a first replenishment signal indicative of (1) an accumulated amount of anti-oxidation replenishment supplied as a result of the exhaustion replenishment during the time interval and (2) an amount of excess anti-oxidation replenishment carried over from a preceding interval, if any;

(d) providing a second replenishment signal indicative of an amount of anti-oxidation replenishment required during the time interval as a function of a stored anti-oxidation replenishment rate;

(e) comparing the first and second replenishment signals at the end of the time interval;

(f) if the second replenishment signal is greater than the first replenishment signal, providing anti-oxidation replenishment in an amount which is a function of a difference between the first replenishment signal and the second replenishment signal;

(g) if the first replenishment signal is greater than the second replenishment signal, providing no anti-oxidation replenishment and determining the amount of excess anti-oxidation replenishment to be carried over to a subsequent interval based upon an amount by which the first replenishment signal exceeds the second replenishment signal;

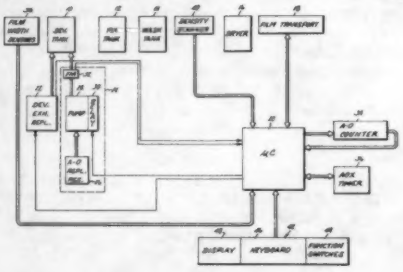
(h) commencing a subsequent time interval in which steps (b)–(h) are repeated.

4,372,666

AUTOMATIC VARIABLE-QUANTITY/VARIABLE-TIME ANTI-OXIDATION REPLENISHER CONTROL SYSTEM

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 16, 1981, Ser. No. 321,394
Int. Cl.³ G03D *3/06*; G05D *11/00*
U.S. Cl. 354—298 **4 Claims**



1. A control system for controlling anti-oxidation replenisher means to provide anti-oxidation replenisher to a processor of photosensitive material, the control system comprising:

means for measuring a time interval and providing a clock signal at the end of the interval;

means for storing an exhaustion replenishment rate;

means for storing an anti-oxidation replenishment rate;

means for providing exhaustion replenishment during the time interval as a function of the use of processor fluid and the exhaustion replenishment rate;

means for providing a first signal indicative of an accumulated amount of anti-oxidation replenishment supplied as a result of the exhaustion replenishment during the time interval;

means for providing a second signal indicative of the amount of anti-oxidation replenishment required during the time interval as a function of expired time and the stored anti-oxidation replenishment rate;

means responsive to the clock signal for comparing the first signal and the second signal at the end of the time interval;

means for providing an amount of anti-oxidation replenishment at the end of the interval, if the second signal exceeds the first signal, in an amount which is a function of the amount by which the second signal exceeds the first signal;

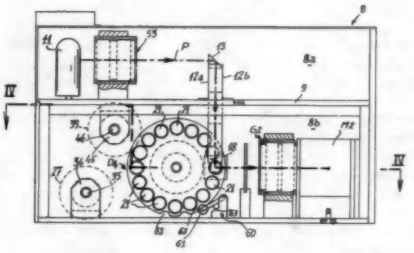
means for extending a subsequent time interval, if the first signal exceeds the second signal, by an amount of time which is a function of the amount by which the first signal exceeds the second signal.

4,372,667

MANUAL ADDITIVE LAMPHOUSE FOR AERIAL IMAGES OF CAPTION STANDS AND OPTICAL PRINTERS

Claude Cattelani, 1, Square de la Mayenne, F-75017 Paris, France

Filed Apr. 14, 1981, Ser. No. 254,207
Claims priority, application France, Jan. 8, 1981, 81 00198
Int. Cl.³ G03B *27/00, 27/32, 27/52*
U.S. Cl. 355—1 **12 Claims**



1. A manual additive lamphouse for aerial images of caption stands and optical printers, comprising a white-light source and a suitable optical system, wherein said lamphouse comprises an optical fiber means which is capable of guiding the white-light beam from the source into the optical system, said system being provided with means for selecting the three primary colors, namely red, blue and green, from the white light transmitted by the optical fiber means, and means for separately dosing each color at the exit of the lamphouse.

4,372,668

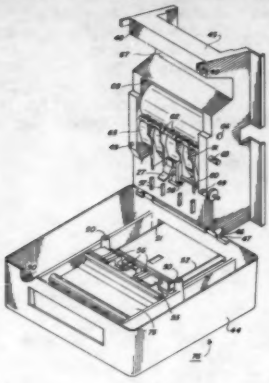
SHEET REGISTRATION ACTUATION

Michael A. Malachowski, Webster; Victor Shur, Henrietta, and Raghulinga R. Thettu, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1980, Ser. No. 219,804
Int. Cl.³ G03G *15/00, 15/28*
U.S. Cl. 355—3 R **10 Claims**

1. Reproducing apparatus comprising a stationary optical system, a platen to support a document to be reproduced, means to transport said platen carrying a document to be reproduced across said stationary optical system, a copy sheet feeding apparatus and a copy sheet registration apparatus to feed a copy sheet in synchronism with the transport of a document by said moving platen, said platen having associated therewith mechanical means to actuate said copy sheet regis-

tration apparatus and means associated with said copy sheet registration apparatus responsive to said platen actuating



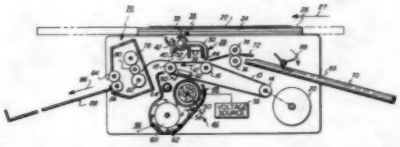
means to directly actuate said copy sheet registration apparatus.

4,372,669

ELECTROPHOTOGRAPHIC PRINTING MACHINE

Joseph Fantuzzo, Webster, and Henry R. Till, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1981, Ser. No. 278,538
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R 10 Claims



1. An electrophotographic printing machine for reproducing an original document on a copy sheet, including:

a photoconductive belt arranged to move in a recirculating path;

a combined charging-transferring unit arranged to charge at least a portion of said photoconductive belt to a substantially uniform level during movement of said photoconductive belt through a first cycle;

a combined exposing-discharging unit arranged to focus a light image of the original document onto the charged portion of said photoconductive belt to selectively discharge the charged portion of said photoconductive belt recording an electrostatic latent image of the original document thereon during the movement of said photoconductive belt through the first cycle;

a combined developing-cleaning unit arranged to transport developer material comprising carrier granules having toner particles adhering triboelectrically thereto into contact with the electrostatic latent image so that the toner particles are attracted thereto to form a toner powder image thereon during the movement of said photoconductive belt through the first cycle;

means for positioning the copy sheet adjacent the toner powder image, said combined charging-transferring unit being arranged to transfer the toner powder image to the copy sheet during movement of said photoconductive belt through a second cycle, said combined developing-cleaning unit being arranged to remove residual toner particles from said photoconductive belt after transfer of the toner powder image to the copy sheet during movement of said photoconductive belt through the second cycle, and said combined exposing-discharging unit being arranged to illuminate said photoconductive belt to eliminate the charge thereon after removing the residual toner particles therefrom during the movement of said photoconductive belt through the second cycle;

means, disposed interiorly of said photoconductive belt, for illuminating said photoconductive belt during the second cycle, said illuminating means being positioned after said combined charging-transferring unit and before said developing-cleaning unit in the direction of movement of said photoconductive belt; and

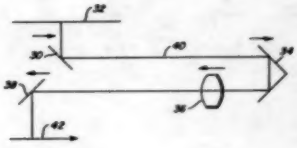
means for disturbing the residual toner particles adhering to said photoconductive belt during the second cycle, said disturbing means being positioned after said combined charging-transferring unit and before said illuminating means in the direction of movement of said photoconductive belt.

4,372,670

PRECESSION SCANNING SYSTEM

Vance J. Carpenter, Fairport, and Abbott Smith, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1981, Ser. No. 237,032
Int. Cl.³ G03B *27/48;* G03G *15/00*
U.S. Cl. 355—8 8 Claims



1. An optical system for scanning a stationary object at an object plane and projecting through a lens, light images of said object along an optical path onto a flat portion of a moving photoreceptor in an image plane, said system comprising:

scanning illumination means for scanning said object, said scan illumination means adapted to decrease the distance between the object plane and the projection lens during each scan cycle, and

projection means, including said projection lens, positioned between said scanning illumination means and said photoreceptor, said projection means adapted for translation along said optical path so as to compensate for said decreased component of object plane-to-lens distance by projecting said light images onto the photoreceptor in a direction opposite to said photoreceptor motion.

4,372,671

SHOCK ABSORBING CARRIAGE DRIVE COUPLING FOR COPIER/DUPLICATORS

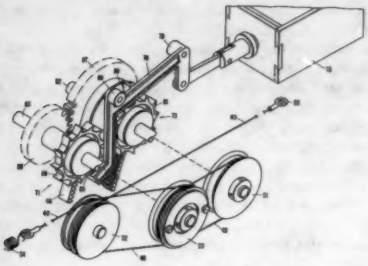
Edward J. Berdinner, Jr., Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,414
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—8 8 Claims

1. In a copier having a mechanical power source and a carriage mounted for reciprocal motion including movement in at least a scanning direction and a return direction, an improved means for interconnecting said power source and said carriage comprising:

means operable during said scanning direction carriage

movement for establishing a relatively rigid coupling between said power source and said carriage; and



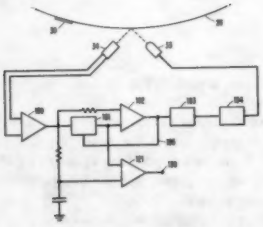
means operable during said return direction carriage movement for establishing a force absorbing, resilient coupling between said power source and said carriage.

4,372,672

SELF-TRIGGERING QUALITY CONTROL SENSOR

Robert W. Pries, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,122
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R 4 Claims



1. A process for indicating changes in light reflectivity of adjacent surface areas on a moving web using a device having a light source positioned for illuminating said areas and a light sensitive element positioned for receiving light originated from said source but reflected from said surface areas with said element producing a sense signal corresponding in magnitude to said received light, said process comprising the steps of:

coupling a signal storage device to said element sense signal continuously while said element sense signal is in a reference condition;

detecting a substantial magnitude change of said element sense signal when the sense signal enters a sample condition;

responding to said detecting step by isolating said storage device and by changing the magnitude of the sample signal to approximately equal said reference signal if a correct quality condition is present;

comparing the magnitude of the adjusted sample signal with the stored reference signal; and

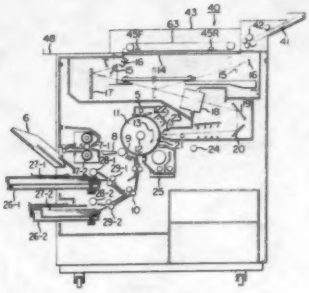
producing an output indication in response to failure of said adjusted sample signal and said reference signal to compare approximately equally in said comparing step.

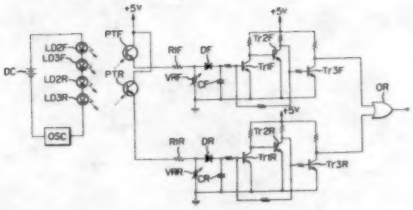
4,372,673

IMAGE FORMING APPARATUS

Masahiro Tomosada; Yoshimasa Kimura, both of Kawasaki, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 42,235, May 24, 1979, Pat. No. 4,264,188.
This application Mar. 12, 1981, Ser. No. 242,721
Claims priority, application Japan, May 31, 1978, 53-65924; May 31, 1978, 53-65925; May 31, 1978, 53-65926; May 31, 1978, 53-65927; May 31, 1978, 53-65928
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R 4 Claims





1. An image forming apparatus, comprising:

means for forming a copy image of an original document on a copy material, said means including movable means for scanning the original document;

means for feeding the original document to a predetermined position for copying;

means for starting said scanning means;

means for feeding the copy material for copying, wherein said copy material feeding means starts its operation after the start of said original document feeding means, but before operation of said starting means;

means for detecting jamming of the original document; and

means for controlling said means for forming a copy image in response to an output from said detecting means.

4,372,674

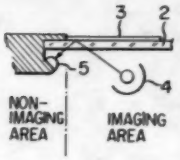
COPYING MACHINE HAVING DETECTORS FOR THE BACKGROUND COLOR AND DENSITY OF THE ORIGINAL

Koji Yukawa; Masayuki Miyazaki, and Takashi Murahashi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1980, Ser. No. 200,977
Claims priority, application Japan, Oct. 29, 1979, 54-140262; Nov. 7, 1979, 54-143949
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D 2 Claims

1. In a copying machine for reproducing an original to be

copied having an image and a background area thereon, and including means for projecting light on the original to be copied, and first detecting means for receiving light reflected from the background portion of the original and for producing a signal in accordance with the density of the light reflected from the background portion of the original, the improvement comprising second detecting means for receiving light reflected from the background portion of the original and for



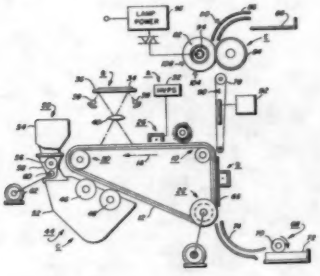
producing a signal in accordance with the wavelength of the light reflected from the background portion of the original, and level discriminating means for receiving the signals produced by said first and second detecting means and for controlling reproduction of the original in accordance with the wavelength and the density of the light reflected from the background portion of the original as represented by said signals of the first and second detecting means.

4,372,675

VARIABLE POWER FUSER CONTROL

Ravi B. Sahay, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1980, Ser. No. 210,903
Int. Cl.³ G03G *15/00, 15/20*
U.S. Cl. 355—14 FU **11 Claims**



4. The method of operating a reproduction machine having a fuser for fixing images produced on copies and having other operating components including the steps of

determining the power available to the reproduction machine,

providing a first power level to operate said other operating components,

providing a residue power level, the residue power level being the difference in power between the available power and the power to operate the other operating components, to operate the fuser;

operating the other operating components and the fuser until the fuser temperature drops below a first temperature level,

inhibiting operations of the other operating components upon detecting the fuser below said first temperature level,

providing the first power level and residue power level to the fuser to raise the fuser temperature to a second level above said first level,

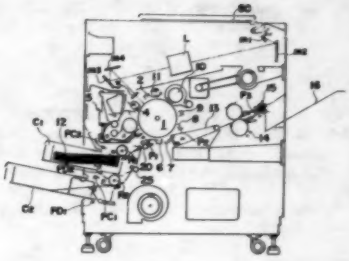
resuming operation of the other operating components to produce copies upon the fuser temperature reaching the second level.

4,372,676

ELECTROPHOTOGRAPHIC COPYING MACHINE

Shin Miyata; Tateomi Kono, both of Toyokawa; Kenji Shibazaki, Aichi, and Yoichi Utsunomiya, Tondabayashi, all of Japan, assignors to Minolta Camera Co., Ltd., Higashi Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 243,715
Claims priority, application Japan, Mar. 19, 1980, 55/35450
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **28 Claims**



16. In an electrophotographic copying machine of a transfer type which comprises an electrophotographic member supported for movement, a support for the support of an original to be copied thereon, means for forming an image on the electrophotographic member in correspondence to the image of the original, means for designating one of a plurality of image forming conditions, and control means operatively associated with the image forming means and the designating means for generating a control signal during a mode of operation based on the image forming condition designated by said designating means, the improvement which comprises a first group of timers utilizable in common to all of modes of operation, means for determining the particular mode of operation on the basis of an output signal generated from the designating means, a second group of timers having their preset times determined in correspondence to the mode of operation determined by the determining means, and a processing means for starting the timers of the first and second groups in a predetermined order for generating a control signal necessary to control the operation of the image forming means incident to the lapse of the preset timers of the times of the first and second groups.

4,372,677

PRECISION PLANAR POSITIONING DEVICE

Ellwood J. Horner, Armonk, N.Y., assignor to American Hoechst Corporation, Somerville, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,791
Int. Cl.³ G03B *27/52, 27/04*
U.S. Cl. 355—41 **6 Claims**

1. A device for precision planar positioning which comprises:

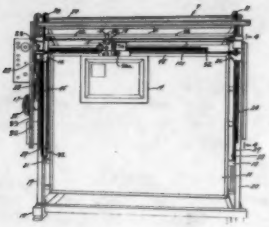
(a) a generally planar frame; and

(b) a cursor; and

(c) means for translating said cursor across the face of said planar frame and fixing said cursor at any of a plurality of positions; and

(d) a planar indicator strip removably fixed along each of two adjacent perpendicular edges of said frame, each strip bearing at least one facial indicia having a substantially different optical density from said strip; and

(e) at least one optical interruptor means, cooperating with said translating means, capable of differentiating between



the optical density of said strips and said indicia and having means for indicating a difference in optical density between said strips and said indicia.

4,372,678

LIGHT-MIXING SYSTEM

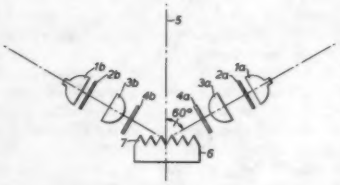
John B. Ikin, Leigh-on-Sea, England, and Denis M. Neale, deceased, late of Brentwood, England (by Adeline I. Neale, executrix), assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 5, 1981, Ser. No. 241,143

Claims priority, application United Kingdom, Mar. 12, 1980, 8008365

Int. Cl.³ G03B *27/72, 27/76*

U.S. Cl. 355—37 **5 Claims**



1. An illumination system for a photographic copying apparatus for mixing light from two light sources, which illumination system comprises disposed along a longitudinal axis a solid light-mixing member of an optically clear material which has as a light-input face a generally planar sulcated face having grooves therein of equilateral triangular cross-section and a substantially smooth light-output face, said two light sources being diametrically opposed relative to the longitudinal axis and each being adapted to direct light on to said light-mixing member from an angle substantially 60° relative to said longitudinal axis, the general plane of said sulcated face of the light-mixing member being disposed normal to the said longitudinal axis and the grooves therein having smooth polished surfaces and extending normal to a plane containing both light sources and the longitudinal axis, light from the two sources passing through the light-mixing member to emerge therefrom substantially along the longitudinal axis.

4,372,679

IMAGE ILLUMINATION COMPENSATION METHOD AND APPARATUS

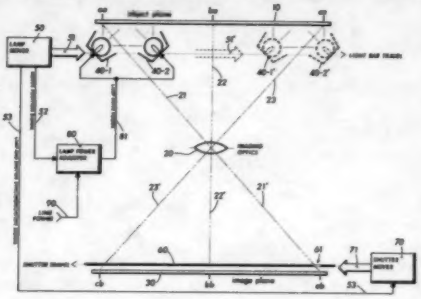
Harold J. Weber, Sherborn, Mass., assignor to Coulter Systems Corp., Bedford, Mass.

Filed Mar. 3, 1981, Ser. No. 240,201

Int. Cl.³ G03B *27/54*

U.S. Cl. 355—70 **21 Claims**

1. Illumination control compensation method, in which an object plane is scanned by effectively moving a source of modulated light along the longitudinal axis of the object plane whereby a part of the light reflected from the object plane is received by imaging optics and projected upon an image plane; said control providing modulation for the said source of light to be effectively less intense when juxtaposed relative to that portion of the object plane which is substantially on-axis with the said optics, and increasingly more effectively intense when



alternatively positioned so as to produce an increase in off-axis angle between the said object plane and the imaging optics; the improved effect providing compensation for the fall-off of light ray coupling efficiency of the off-axis rays relative to the on-axis rays impinging on the optics and thereby producing substantially uniform illumination at the image plane, at least in the direction of effective light source travel.

4,372,680

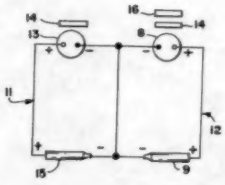
MINIATURE SPECTRALLY SELECTIVE DOSIMETER

Richard R. Adams, Newport News; Ian O. MacConochie, Yorktown, and Bordie D. Poole, Jr., Seaford, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 8, 1980, Ser. No. 195,223

Int. Cl.³ G01V *1/48*

U.S. Cl. 356—51 **8 Claims**



1. A spectrally selected radiation measuring device for measuring the amount of radiation on a mobile surface comprising:

detector means for detecting radiation;

filter means located between the radiation measuring source and said detector means for allowing only selected wavelength bands to be detected by said detector means;

electrochemical integrator means for integrating the output of said detector means;

means for packaging said detector means, integrating means, and filter means compactly;

means for attaching packaged means so that said detector means remains at all times in close proximity and substantially parallel to the mobile surface being measured;

readout means for reading out electrochemical integrator data and wherein said readout means comprises means for constantly discharging said electrochemical integrator; and

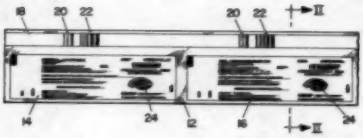
means for indicating when said electrochemical integrator is completely discharged, whereby the time taken to discharge the electrochemical integrator is indicative of the amount of radiation integrated.

4,372,681

STREAMLINED LABEL VERIFICATION TECHNIQUE

M. Douglas Sallenbach, Costa Mesa, Calif., assignor to Avery International Corp., San Marino, Calif.

Filed Aug. 18, 1980, Ser. No. 178,729
Int. Cl.³ B65C 3/08, 9/08
U.S. Cl. 356—72 **16 Claims**



1. A method for verifying the accuracy of labels to be applied to containers containing drugs or other products requiring special handling comprising the steps of:

preparing a backing tape with individual pressure sensitive labels mounted across one portion of the width of said backing tape, and a continuous strip of label stock material mounted on another portion of the width of said backing tape;

printing the label including identification of the product;

printing a machine readable identification of the product on the continuous strip, adjacent the label;

checking the machine readable identification on said continuous strip as said labels are being applied to the containers; and

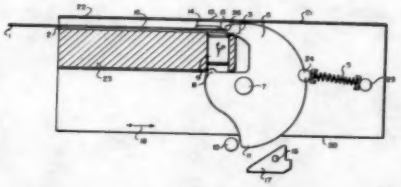
rewinding the continuous strip along with the backing tape following the checking step and the application of labels to the containers.

4,372,682

MEDICAL TEST STRIP HOLDING DEVICE

Klaus Neuninger, Mannheim, and Rainer Van Rijckevorsel, Brühl, both of Fed. Rep. of Germany, assignors to Clinicon Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 244,988
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011223; Apr. 26, 1980, 3016198
Int. Cl.³ G01N 21/13
U.S. Cl. 356—244 **12 Claims**



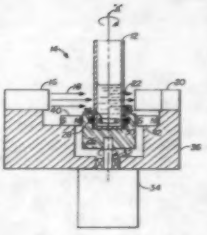
1. A device for positioning and firmly holding a medical test strip, said device comprising: a housing having a strip reception opening, means forming a stop at the inner end of the opening for the inserted end of the test strip and a window positioned to be opposite a predetermined test zone of the test strip when inserted into the reception opening and abutting against the stop; means for pressing substantially at right-angles on the rear side of the test-strip strip towards said window, the pressing means being movable between a rest position wherein it is spaced from the rear side of the inserted test strip and a pressing position in which it presses the test strip against the window; and means responsive to the insertion of a test strip for moving the pressing means from the rest to the pressing position and for applying a pressing force which is substantially uniform in the positions corresponding to various thicknesses of insertable test strips.

4,372,683

PHOTOMETER WITH ROTATING SAMPLE CONTAINER

James C. Sternberg, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 71,813, Sep. 4, 1979, abandoned. This application Sep. 9, 1981, Ser. No. 300,419
Int. Cl.³ G01N 21/47, 21/84
U.S. Cl. 356—338 **3 Claims**



1. In photometric analysis apparatus of the type having an optical measuring station at which a sample container holds sample material to be optically measured, the sample container including a plurality of window areas in a wall thereof for passing light into or out of the container during a measurement interval along one or more optical axes intersecting the measuring station, and optical detection means on one such axis for viewing the measuring station and operative during a measurement interval to monitor light exiting a window area of the container to develop an optical measurement of the sample within the container, the improvement characterized by:

means for rotatably supporting the sample container at the measuring station; and

means for rotating the container during a measurement interval to cause the window areas thereof to rotate past the detection means at a rotational speed sufficient to cause the detection means to effectively integrate the light exiting the container through all window areas of the container thus viewed, thereby compensating for optical variations or imperfections in individual window areas of the sample container.

4,372,684

HOLOGRAPHIC APPARATUS TO MEASURE THE SURFACE FIGURE OF A NONLINEAR AXICON AND OTHER OPTICAL ELEMENTS

Bruce J. Bartholomew, Poway, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed May 13, 1981, Ser. No. 263,286
Int. Cl.³ G01B 9/021
U.S. Cl. 356—348 **10 Claims**

10. A method for testing an entire nonlinear surface by holographic interferometry comprising,

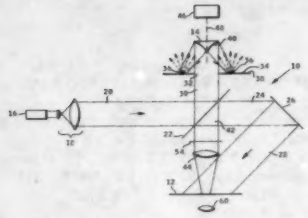
providing a source of spatially coherent light,

directing said spatially coherent light first onto the surface to be measured,

directing a beam of temporally coherent scattered light reflected from said surface onto a holographic medium,

forming a reference beam and directing said beam to said holographic medium, and

rotating said surface to form an interferogram between the rotated surface image and the unrotated image reconstructed by the hologram which indicates errors in the surface figure of said surface.

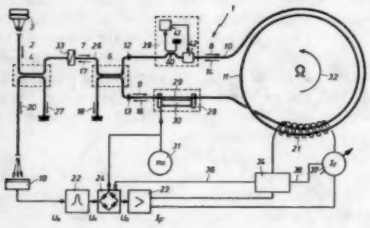


4,372,685

METHOD AND ARRANGEMENT FOR THE MEASUREMENT OF ROTATIONS

Reinhard Ulrich, Leonberg, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,853
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901388; Feb. 22, 1979, 2906870
Int. Cl.³ G01B 9/02
U.S. Cl. 356—350 20 Claims



8. An apparatus for the measurement of rotations by the Sagnac effect in a light path which encircles an area and which is rotating at a rate to be measured, comprising:

a beamsplitter including means for splitting an input light flux into two coherent light beams and respectively coupling said beams into both ends of said light path to traverse said light path in opposite directions, to thereby produce a phase difference of 2Δ between said beams and which further includes means for recombining said light beams after they have traversed said light path to form first and second output light fluxes, and means for directing said first output light flux back towards the source of said input light flux;

a photoelectric detector coupled to receive said first output flux to measure the intensity thereof;

a phase modulator which modulates the phase of said two coherent light beams;

a phase-sensitive rectifier coupled to receive an output signal of said detector for producing an electrical error signal whose magnitude and sign are proportional to sin (2Δ);

an automatic control loop coupled to receive said error signal from said rectifier, said loop maintaining with high accuracy said phase difference 2Δ equal to an integer multiple of 2π; and

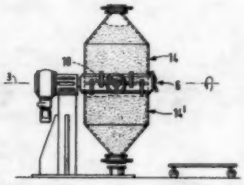
a combination of a monomode waveguide and a polarizer provided between said beamsplitter and a branching device which separates said first output light flux going to said detector from the path of the input light flux, said combination being traversed in opposite directions by said input light flux and by said first output light flux which is used for the detection.

4,372,686

DOUBLE-CONE ROTATING MIXER

Friedrich W. Herfeld, Wall 1, 5982 Neuenrade, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,372
Int. Cl.³ B01F 9/02
U.S. Cl. 366—220 6 Claims



1. Double-cone rotating mixer, the double cone mixing container of which is rotatable about a horizontal rotational axis, aligned at a right angle to the container axis, characterized by the following features:

(a) the mixer spindle (3') carries a ring (6);

(b) the ring (6) possesses on its front faces two ring clamping areas (7,7') with clamping devices (8,8');

(c) a closing valve (10), adapted to the inner cross-section of the ring, is pivotable about a swivelling axis (9);

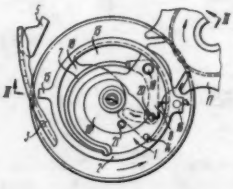
(d) two half containers (14,14') each comprising a contact surface (18), suited for one of the ring clamping areas (7,7'), as well as a conical bottom part (16).

4,372,687

INSTANTANEOUS CALENDER DEVICE WITH SPRING AND TAPPET MOUNTED ON ROTARY SHIFTER

Boris P. Krasovsky, ulitsa Shkolnaya, 12, kv. 54, Krasnogorsk Moskovskoi oblasti; Vladimir V. Melnik, ulitsa Junykh Lenintsev, 79, korpus 1, kv. 54, and Daniel D. Malkin, ulitsa Junykh Lenintsev, 95/13, korpus 1, kv. 31, both of Moscow, all of U.S.S.R.

PCT No. PCT/SU79/00036, § 371 Date Feb. 23, 1980, § 102(e) Date Feb. 22, 1980, PCT Pub. No. WO80/00197, PCT Pub. Date Feb. 7, 1980
PCT Filed Jun. 15, 1979, Ser. No. 195,198
Claims priority, application U.S.S.R., Jun. 23, 1978, 2633720
Int. Cl.³ G04B 19/24
U.S. Cl. 368—28 1 Claim



1. An improved instantaneous calendar device comprising a date ring; a day disk with a star wheel; a rotary shifter with pins interacting with said date ring and said star wheel of said day disk to rotate said date ring and said day disk at appropriate intervals; stops retaining said date ring and said star wheel of said day disk in position after being rotated by said pins of said rotary shifter; and an actuator including a spring, a tappet, a calendar wheel and a cam having an abrupt slope, said rotary

shifter being connected to said calendar wheel for rotation by said calendar wheel, said spring and said tappet being mounted on said rotary shifter and said cam being mounted on a stationary portion of said calendar device, and means for coiling said spring as said rotary shifter rotates and said spring being uncoiled when said tappet contacts the abrupt slope of said cam to cause sharp rotation of the rotary shifter and interaction of the pins of the rotary shifter with the date ring and the star wheel of the day disk.

4,372,688

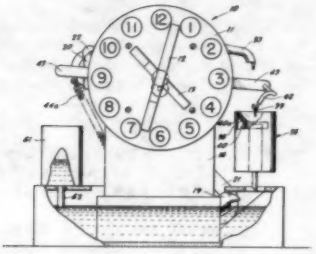
LIQUID OPERATED CLOCK

Victor H. Chatten, 1567 W. 215th St., Torrance, Calif. 90501

Continuation-in-part of Ser. No. 343,414, Jan. 28, 1982. This application Feb. 22, 1982, Ser. No. 351,326

Int. Cl.³ G04B 1/26

U.S. Cl. 368—65 6 Claims



1. In a liquid operated clock, the combination of: a liquid reservoir, means for transferring predetermined amounts of liquid from said reservoir to an elevated receptacle at regular time intervals, a receiver positioned to receive liquid gravitating from said receptacle, a movable member, means for suspending said receiver from said movable member, resilient means acting on said movable member to counterbalance the weight of said receiver and its liquid contents, means connected to said receiver to cause it to empty suddenly upon receiving a series of said predetermined amounts of liquid and thereby to cause movement of said movable member by said resilient means, a clock mechanism driven from an input shaft, and ratchet means driven in response to said movement of said movable member for turning said input shaft intermittently.

4,372,689

ELECTRONIC WATCH MOVEMENT

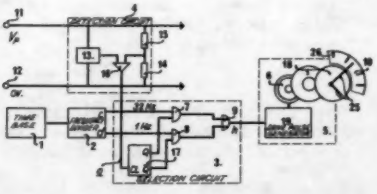
Grandjean Remy, Fontainemelon, Switzerland, assignor to Ebauches, S.A., Switzerland

Filed Oct. 24, 1980, Ser. No. 200,325

Claims priority, application Switzerland, Oct. 25, 1979, 9580/79

Int. Cl.³ G04C 15/00; G04B 1/00

U.S. Cl. 368—155 6 Claims



1. An electronic watch movement comprising a time base circuit, a frequency divider circuit supplied by the time base, an actuating circuit connected to said divider circuit, a display system actuated by said actuating circuit, voltage input terminals adapted to be connected to an internal voltage source or to a external voltage source thereby to supply said circuits, said external voltage being different from said internal voltage a detecting circuit connected to the voltage input terminals for generating a logic signal in response to said external voltage and a selection circuit responsive to said logic signal for producing at least one test signal applied to said actuating circuit.

4,372,690

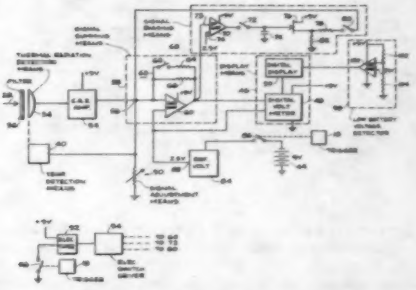
THERMAL RADIATION MEASURING ARRANGEMENT

Herbert L. Berman, and James C. Sprout, both of Los Altos, Calif., assignors to Linear Corporation, Inglewood, Calif.

Filed Mar. 6, 1981, Ser. No. 241,467

Int. Cl.³ G01F 5/10

U.S. Cl. 374—29 14 Claims



1. A thermal radiation measuring arrangement for measuring the rate of thermal radiation emitted from a surface in a first operating condition and for measuring the rate of thermal radiation heat exchange between two surfaces in a second operating condition, and comprising, in combination:

thermal radiation detection means for receiving thermal radiation and generating a first output signal having a magnitude proportional to said thermal radiation;

temperature detection means for detecting the temperature in regions adjacent said thermal radiation detection means and generating a second output signal having a magnitude proportional to said detected temperature;

signal summing means for receiving said first output signal and said second output signal and generating a third output signal in response thereto, and said third output signal having a magnitude proportional to said sum of said first output signal and said second output signal in a first operating condition;

signal biasing means selectively connectable to said signal summing means for generating a fourth output signal having a first magnitude sufficient to cause said third output signal to be zero for said thermal radiation detection means receiving thermal radiation from a first surface, and said signal biasing means, including control means for maintaining said fourth output signal at said first magnitude thereof for said thermal radiation detection means receiving thermal radiation from a second surface, having a temperature different from said first surface;

switch means for selectively connecting said signal biasing means to said signal summing means in a second operating condition and disconnecting said signal biasing means from said signal summing means in said first operating condition;

whereby, said third output signal has a magnitude proportional to the rate of thermal radiation received by said thermal detection means in said first operating condition, and said third output signal has a magnitude proportional to the rate of radiation heat transfer between said first

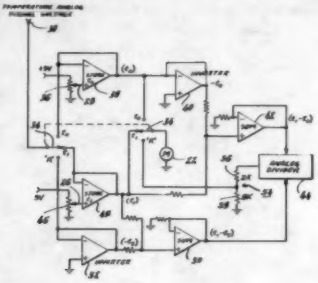
surface and said second surface in said second operating condition.

4,372,691

METHOD AND APPARATUS FOR DETERMINING THE THERMAL RESISTANCE OF A STRUCTURE SUCH AS A WALL CEILING OR THE LIKE

Robert E. Buckley, Norwalk, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed Feb. 5, 1981, Ser. No. 231,664
Int. Cl.[3] G01N 25/18
U.S. Cl. 374—44 7 Claims



1. An 'R' value meter for providing a direct reading, noncontact measurement of the thermal resistance of a structure such as a wall, ceiling or the like after the inside room temperature and the outside temperature are applied thereto comprising:

first storage means for storing the inside room temperature signal applied thereto,

second storage means for storing the outside temperature signal applied,

first means for combining the outputs of said first and second storage means to provide a first difference signal,

second means for combining a signal representing the inside surface temperature of the structure whose 'R' value is desired to be determined, and the output of said first storage means to provide a second difference signal,

divider means for dividing said first difference signal by said second difference signal,

a meter, and

means for coupling a portion of the output of said divider means to said meter for providing a direct 'R' value reading which is indicative of the thermal resistance of the structure being measured.

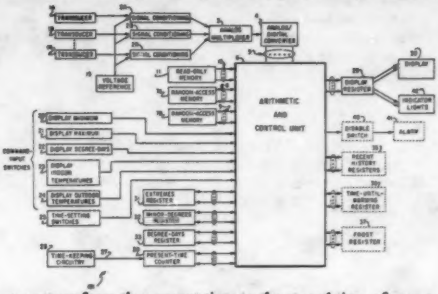
4,372,692

ELECTRONIC DEVICE TO RECORD TEMPERATURES AND THE TIME OF OCCURRENCE

Irving H. Thomae, Norwich, Vt., assignor to Trustees of Dartmouth College, Hanover, N.H.

Continuation of Ser. No. 75,953, Sep. 17, 1979, Pat. No. 4,286,465. This application Jun. 4, 1981, Ser. No. 270,618
The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.
Int. Cl.[3] G01K 7/00
U.S. Cl. 374—104 8 Claims

1. A digital min-max thermometer that comprises: temperature transducer means for periodically sensing the temperature in the surrounding environment and for providing a signal representative of that temperature; means to provide the corresponding time of occurrence of the temperature thus sensed storage means for storing previously attained minimum and maximum values of temperature and the times of occurrence of each extreme; means for comparing the most recent sensed temperature with stored values of temperature for an interval of time in order to find the minimum and maximum temperatures, and their times of occurrence, attained during that interval; means for displaying the extreme temperatures for said interval together with the times of occurrence of each such extreme; means to perform periodically an extrapolation of



temperature from the present time to the stored time of occurrence of either the maximum or minimum temperature for the preceding interval, in order to estimate the highest or lowest temperature likely to be attained in the present interval.

4,372,693

TEMPERATURE EXCURSION SENSING AND LOCATING APPARATUS

Michael A. Lutz, San Carlos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 30, 1981, Ser. No. 229,913
Int. Cl.[3] G01K 7/00; G08B 17/00
U.S. Cl. 374—111 8 Claims

1. Temperature excursion sensing and locating apparatus, comprising:

a first electrical conductor;

a second electrical conductor comprising a plurality of serially connected, normally conductive, thermostatic devices for detecting temperature conditions, each of the thermostatic devices opening and thus becoming nonconductive upon detection of a predetermined temperature excursion; and

a dielectric member disposed between first and second electrical conductors, said first and second electrical conductors and dielectric member having an original capacitance value while the thermostatic devices are conductive and a reduced capacitance value upon detection of the predetermined temperature excursion by a thermostatic device said conductors connectable to a capacitance measuring device which compares the original and reduced capacitance values to determine the presence of a predetermined temperature excursion and the ratio of said capacitance values determining its location.

4,372,694

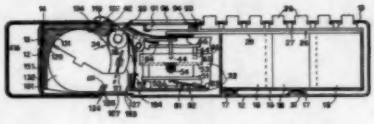
ELECTRONIC POCKET CALCULATOR

Michele Bovio, Brosso, and Filippo Demonte, Cavaller Maggiore, both of Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy

Filed Jan. 7, 1981, Ser. No. 223,166
Claims priority, application Italy, Jan. 18, 1980, 67067 A/80
Int. Cl.[3] B41J 3/36
U.S. Cl. 400—88 12 Claims

1. A printing electronic calculator for printing amounts on a

recording medium from a roll comprising a parallelepipedal case, including an internal housing for housing the roll, a printing unit for printing on the recording medium which unwinds from the roll, and a platen for supporting the recording medium in front of the printing unit, wherein the calculator comprises a base and a top cover having an opening with an edge adjacent to the platen and the printing unit for the passage of the recording medium to the external of the case, a movable cover guided slidably by the base and the top cover and having an edge cooperative with said opening, wherein said cover is movable between an inoperative position and a working posi-



tion, wherein the edge of the movable cover in the inoperative position of the cover registers with the edge of said opening to protect the printing unit and prevent the passage of the recording medium to the external of the case and wherein said movable cover in its operative position uncovers the opening and allows the passage of the recording medium to the external of the case and wherein means are provided to prevent actuation of the printing unit by the calculating unit when the movable cover is in the inoperative position and to enable the calculating unit for printing on the recording medium from the roll when the movable cover is in the operative position.

4,372,695

PRINTING APPARATUS

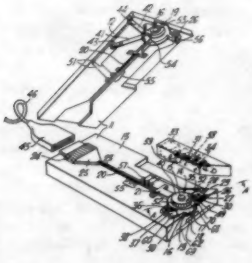
William L. Ross, Barnsgate, Herons Ghyll, Nr. Uckfield, Sussex, England

Continuation-in-part of Ser. No. 65,378, Aug. 9, 1979, abandoned, which is a continuation of Ser. No. 915,503, Jun. 14, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 168,377

Claims priority, application United Kingdom, Jun. 16, 1977, 25281/77

Int. Cl.³ B41J *3/10, 3/16, 27/16*

U.S. Cl. 400—119 **5 Claims**



1. In a printer of the type in which print is formed on a drum by an electrostatic process and is transferred therefrom onto a print receiving surface of a print medium by means solely of pressure acting between the print medium and the drum, an improved head comprising in combination:

housing means;

a print drum supported for rotation about an axis in said housing means, said print drum having a cylindrical surface formed by a uniform dielectric layer on a conductive cylindrical form, and said housing means incorporating a printing station at which the print is transferred to said print medium;

means for connecting said conductive form to a first potential source;

an image forming means positioned in said housing means adjacent said drum and at a position spaced circumferentially with respect to the printing station, said image forming means comprising an array of electrodes each for connection to a respective pulse source means and each extending into direct physical contact with the dielectric layer on the periphery of the drum, said array extending over the width of the drum;

means for detecting the angular displacement of the drum due to rotation thereof in the housing;

means connected to said respective pulse source means and to said means for detecting the angular displacement of the drum for selectively enabling the pulse source means whereby the electrodes are pulsed in a prescribed sequence with a voltage signal derived from a second potential source in response to the angular displacement of the drum so as to form a charge image of one or more preselected characters on said dielectric surface;

inking means positioned in said housing means adjacent the said drum and between the image forming means and the printing station, said inking means including means for supplying ink and means for applying said ink to the drum after said charge image has been formed and before the charge image has reached the printing station as a result of rotation of the drum whereby print corresponding to one or more characters is formed by ink adhering to the charged areas on the dielectric surface of the drum, said ink applying means comprising at least one electrode means for connection to a third potential source which is spaced from said drum and is arranged so that the electrostatic field which is formed as each charge image passes the electrode means causes transfer of ink from the ink applying means to the areas on the drum on which the charge defining the charge image is confined;

the electrode means of the ink applying means comprising a cylindrical roller arranged for rotation in said housing on an axis parallel to the axis of rotation of said drum and means for rotating the roller when the said drum rotates at a rate proportional thereto, said roller being of considerably smaller diameter than the drum and being spaced therefrom at such a distance that the surface of the drum and the facing surface of the roller closely approach one another only along the plane containing the two axes of rotation;

the ink for use by the ink supplying means being a dry particulate material comprising appropriate pigments and magnetizable material all carried in a pressure fusible resin base and said inking roller having an outer surface formed by a sleeve of electrically conductive rubber wherein magnetic particles are entrained, said sleeve being premagnetized across the length of the roller in discrete spaced apart bands around the periphery thereof; and

a hopper means for containing a supply of ink and having an ink feed outlet, electromagnetic ink feeding means consisting of a series of coils arranged along a duct which extends from the hopper ink feed outlet through the housing means to the said roller and means for sequentially energising said coils so as to effectively pull the particulate material along the duct from the hopper to the roller.

4,372,696

HIGH QUALITY PRINTER

Frederick M. Pou, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 20, 1980, Ser. No. 151,577

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **45 Claims**

1. A matrix printer suitable for printing characters on a sheet stock medium, comprising:

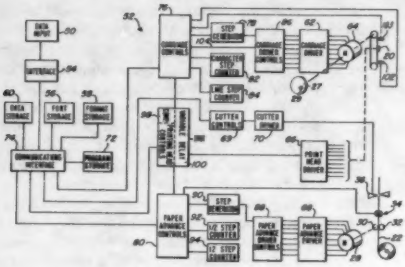
means including a printing head having a plurality of printing

units arranged in an array for making imprints at desired locations defining the character being printed;

means coupled to said printing head for transporting said printing head with respect to said sheet stock medium in a first direction with respect to the direction of said array;

means coupled to said transporting means for determining the position of said printing head along said first direction with respect to said sheet stock medium;

means coupled to said printing head and responsive to said



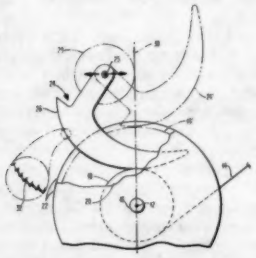
position determining means for activating predetermined ones of said printing units to generate imprints on said sheet stock medium at predetermined delay times after said printing head reaches predetermined positions along said first direction with respect to said sheet stock medium, said predetermined delay times being different for the various printing units and variable as a function of the predetermined positions along said first direction relative to the desired locations of the imprints defining the character being printed.

4,372,697

RIBBON DRIVE ARRANGEMENT FOR A PRINTER

David H. Babcock, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,285
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—232 **15 Claims**



1. Tape drive apparatus for advancing a tape from a supply, said tape drive apparatus comprising:

a tape reel mounted for rotation about a reel axis, said reel defining a wrap plane for tape accumulation as a cylinder of overlaid convolutions having an outer circumference;

an elongate drive blade, mounted to move generally in said wrap plane, and having a drive edge that is asymmetrically textured to have a higher tendency to slip in a first longitudinal direction than in the opposite longitudinal direction;

means for urging said drive edge against said outer circumference of said tape cylinder;

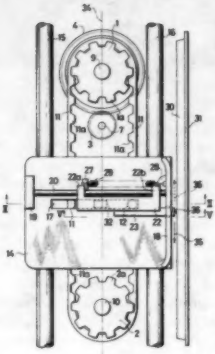
means for oscillating said drive blade whereby said drive edge imparts increments of motion to said tape reel in the direction corresponding to the lower tendency for drive edge slippage.

4,372,698

DRIVING DEVICE FOR A PRINT HEAD OF A PRINTER

Akira Matsushima, 1-1, Taihei 4-chome, Sumida-ku, Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 241,537
Claims priority, application Japan, Mar. 11, 1980, 55-30668; Nov. 13, 1980, 55-159948
Int. Cl.³ B41J *19/20, 25/30*
U.S. Cl. 400—320 **2 Claims**



1. A driving device for a print head of a printer having an elongated platen comprising:

a pair of rotatable belt wheels disposed in spaced relationship along a line extending generally parallel to the platen;

an endless belt entrained around said belt wheels;

drive means for rotationally driving at least one of said belt wheels in one direction;

a drive pin secured to said belt and projecting upwards;

a carriage slidably movable in parallel to the platen, said carriage being provided with an elongated hole extending at approximately a right angle with respect to the platen and slidably receiving therein said drive pin;

a print head having a support member slidably supported on said carriage at approximately a right angle with respect to the platen;

a coil spring for biasing said support member toward the platen; and

shift means for moving said support member away from the platen against the force of said coil spring as said drive pin moves away from the platen, the shift means comprising a projection extending downwards from said support member into said elongated hole such that said projection is pushed backwards by said drive pin against the force of said coil spring when said drive pin moves away from the platen.

4,372,699

SHEET FEEDER FOR TYPEWRITERS

Paul A. Quinn, Jr., Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 85,826, Oct. 17, 1979, abandoned. This application Jul. 15, 1981, Ser. No. 283,694
Int. Cl.³ B41J *11/58, 13/10*; B65H *5/22*
U.S. Cl. 400—625 **3 Claims**

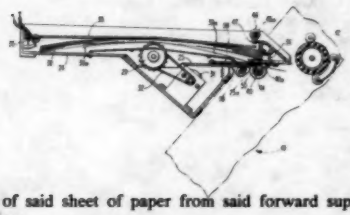
1. A sheet paper feed apparatus for a typewriter for feeding individual sheets of paper to the platen of the typewriter, said typewriter including platen drive means for feeding paper

around the platen and into a position for typing thereon; said apparatus comprising:

a rectangular tray including a rear paper support portion and a spaced apart forward paper support portion for supporting thereon the opposite ends of a stack of paper;

a shingler wheel intermediate said support portions, and projecting above a plane lying through said support portions to engage the lowermost sheet of said stack of paper and to support the center of the stack of paper to form a concave bow therein so that only the opposite ends of said stack of paper are supported by said support portions; a motor drive means connected to said shingler wheel to effect reversable rotation thereto, said motor responsive to a first command for effecting rotation of said shingler wheel in a first direction to slide the lowermost sheet of paper of said stack of paper towards said rear support portion until said forward support portion no longer supports said lowermost sheet;

first sensing means mounted on the tray for sensing separation of said sheet of paper from said forward support portion;



paper sheet camming means beneath said forward support portion to aid in downward deflection of said lowermost sheet, and circuit means responsive to the sensing means sensing such separation for effecting motor drive means direction reversal and thus reversal of the direction of rotation of said shingler wheel to thereby urge said lowermost sheet in a second direction under said forward support portion toward said platen;

a first sheet drive roll adjacent said camming means for grasping said lowermost sheet and means for effecting rotation of said first sheet drive roll for directing said lowermost sheet of paper towards the platen of said typewriter, and a second sheet drive roll superimposed of said first sheet drive roll, and means for effecting rotation of said second sheet drive roll in synchronism with rotation of said first sheet drive roll and said platen to advance sheets of paper received from the platen of the typewriter to a position superimposed of said stack of paper.

4,372,700

SUCTION PUMP RESERVOIR BRUSH

Merritt L. Moffitt, Jr., 9 Weirwood Rd., Radnor, Pa. 19087

Filed Jun. 24, 1981, Ser. No. 276,847

Int. Cl.³ A46B *11/04*

U.S. Cl. 401—157 **3 Claims**

1. A suction pump reservoir brush apparatus, comprising:

bristle means for brushing soil from surfaces;

a support head for holding said bristle means, said head having a passageway therethrough connected to open at said bristle means;

a cylindrically-shaped chamber connected to said passageway and a portion of said support head away from said bristle means;

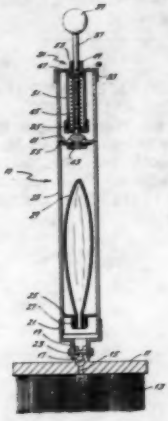
a cap enclosing the free end of said chamber away from said support head;

an actuating rod extending through said cap;

a disk-shaped piston including a peripheral skirt canted in sealing engagement with said chamber and on the end of said rod within said chamber, having a hole therethrough and a mounting head attached to said rod end having a first portion with air passageways against which said piston seats during a priming stroke, a second portion about which said piston is positioned and a third portion against which said piston seats during a vacuum stroke;

said piston having an initial inoperative position at said cap end of said chamber;

a small vent hole through the wall of said chamber near the inactive position of said piston and on the support head side thereof;



a flow regulating screw valve extending through said support head passageway;

a partition across said chamber at said support head end, said partition having an opening therethrough;

a mounting surface connected to said partition extending about said opening forming a collar extending about said partition opening and toward said passageway; and

a balloon-like membrane connected to said collar.

4,372,701

FIXING STRUCTURE

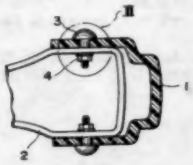
Takeshi Watanabe, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 25, 1980, Ser. No. 172,264

Claims priority, application Japan, Jul. 26, 1979, 54-103921[U]

Int. Cl.³ F16B *35/04*

U.S. Cl. 403—24 **6 Claims**



1. A structure for fixing a bumper and a support member together, comprising:

(a) a bolt having a head, a first stem portion of substantially circular cross section, a second stem portion of a non-circular cross-section smaller than that of the first stem portion, and a threaded portion, connected in this order;

(b) a portion of the bumper in which is formed a slot through which is passed the first stem portion, thereby alleviating

longitudinal stress in the bumper due to thermal deformation;

(c) a portion of the support member in which is formed a hole of substantially the same size and shape as the second stem portion and through which the second stem portion is passed;

(d) a nut screwed onto the threaded portion of the bolt so as to hold the bumper between the head of the bolt and the support member, and in a fashion that the bolt is unable to turn with respect to the support member; and

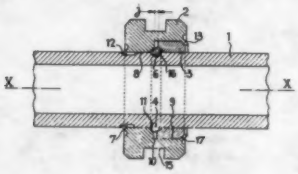
(e) the support member being held between a shoulder formed in the bolt between the first and second stem portions and the nut.

4,372,702

PISTON AND ROD ASSEMBLY FOR SLIDING IN A CYLINDER

Gerard L. Devaud, Paris, France, assignor to Societe d'Applications des Machines Motrices, Issy-les-Moulineaux, France

Filed Jan. 21, 1981, Ser. No. 227,112
Claims priority, application France, Jan. 25, 1980, 80 01590
Int. Cl.³ F16D 1/06
U.S. Cl. 403—24 4 Claims



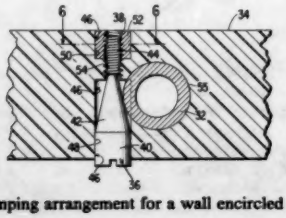
4. A piston and rod assembly for sliding in a cylinder, said assembly comprising a piston which has two annular members which define bores whose diameters correspond to an outside diameter of the rod, an annular groove in the rod, and a rigid ring partly engaged in the annular groove and interposed between the two annular members, the ring being in a prestressed condition in the groove between the two annular members, a first member of said annular members constituting a body of the piston and defining a counterbore in which a second member of said annular members is fitted, means for interconnecting the first member and the second member longitudinally of the rod, the rod having a second annular groove and said first annular member having, on a side thereof opposed to the second annular member, an axial extension which is formed over toward the rod into the second groove of the rod so as to retain said first annular member on the rod.

4,372,703

TAPERED SCREW FASTENING MEANS FOR BUSHINGS, SLEEVES AND BEARINGS

Jan Szostak, Lincroft, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,245
Int. Cl.³ B25G 3/18; F16B 21/00; F16D 1/00
U.S. Cl. 403—324 12 Claims



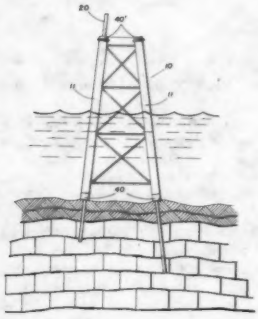
1. A clamping arrangement for a wall encircled cylindrical bushing, sleeve, bearing or like part which is supported in a structural member against movement in directions perpendicular to the longitudinal axis of the part, said arrangement including a hole in the structural member located to one side of the longitudinal axis of the supported part and extending perpendicularly in a non-radial direction relative to said axis, the hole being so disposed that a portion of the wall of said part projects into said hole; and a threaded clamping device in said hole including a material entering end portion, an opposite head end portion adapted to receive a tool for applying a turning torque thereto effective to advance the device in said hole, and a tapered intermediate portion which is converging in a direction extending from the head end portion to the material entering end portion and which is forced against said projecting wall portion of the supported part by the advance of the device to prevent movement of the supported part in said structural member.

4,372,704

METHOD AND APPARATUS FOR GROUTING OF OFFSHORE PLATFORM PILINGS

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 818,174, Jul. 22, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 2,919
Int. Cl.³ E02D 5/00, 5/14
U.S. Cl. 405—225 18 Claims



1. An inflatable packer for use in the sealing of an annulus formed by a jacket leg and/or pile sleeve of a marine platform having a pile inserted therethrough prior to the grouting of said annulus, or the like, said inflatable packer comprising:

an annular packer housing secured to said jacket leg, said pile sleeve, or the like;

a first guide ring secured within said annular packer housing having a portion extending therefrom;

a second guide ring secured within said packer housing having a portion extending therefrom;

an annular inflatable packer member having a first end portion, intermediate portion, a second end portion and having reinforcing means therein, the first end portion being secured from axial movement within said packer housing by being secured to the portion extending from said first guide ring while the second end portion of said inflatable packer member is secured from axial movement within said packer housing by being secured to the portion extending from said second guide ring;

a first back-up shoe secured to said first guide ring adjacent the first end portion of said inflatable packer member being located on the interior thereof, said first back-up shoe comprising:

a unitary annular band having a plurality of fingers extending therefrom, each finger of the plurality of fingers being separated from an adjacent finger thereby form-

ing a space between each adjacent finger of the plurality of fingers

whereby said first back-up shoe overlays the first end portion of said inflatable packer member thereby preventing the first end portion of said inflatable packer member from extending into said annulus before the inflation of said inflatable packer to prevent said pile from damaging said inflatable packer member during the insertion of said pile therethrough; and

a second back-up shoe secured to said second guide ring adjacent the second end portion of said inflatable packer member being located on the interior thereof, said second back-up shoe comprising:

a unitary annular band having a plurality of fingers extending therefrom, each finger of the plurality of fingers being separated from an adjacent finger thereby forming a space between each adjacent finger of the plurality of fingers

whereby said second back-up shoe overlays the second said portion of said inflatable packer member thereby preventing the second end portion of said inflatable packer member from extending into said annulus before the inflation of said inflatable packer to prevent said pile from damaging said inflatable packer member during the insertion of said pile therethrough

whereby when said inflatable packer member is inflated to seal said annulus, said inflatable packer member is inflated inwardly so that the intermediate portion thereof firmly engages said pile to seal said annulus while said first back-up shoe and said second back-up shoe have the plurality of fingers thereof deflected inwardly until seated on said pile thereby lending axial support to said inflatable packer member and preventing axial extrusion of the first end portion and second end portion of said inflatable packer member over said first end ring and said second end ring respectively during the inflation of said inflatable packer member and the grouting of said annulus.

4,372,705

ARTICULATED EROSION CONTROL SYSTEM

Francis S. Atkinson, 4921 Purdue St., Metairie, La. 70003

Filed Nov. 18, 1980, Ser. No. 207,879
Int. Cl.³ E02B *3/12*
U.S. Cl. 405—19 **17 Claims**

1. An erosion control mat comprising:

a. a plurality of erosion controlling members connected to each other so that the members form an interconnected network conforming to the underlying terrain for preventing erosion

b. adjacent member including complementary angularly articulating connection means for connecting the members and allowing articulation of the lower surfaces thereof relative to one another to conform to the underlying terrain; and

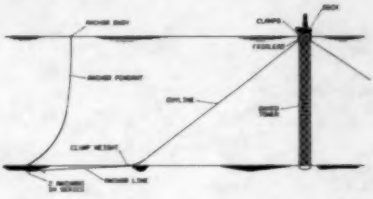
c. the articulating connection means including interconnecting sockets and arms on adjacent blocks, the arms loosely engaging the sockets so that the adjacent members are capable of articulating movement relative to each other and at the same time maintaining their relative spacial arrangement.

4,372,706

EMERGENCY CABLE GRIPPER

Kenneth E. Young, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 6, 1980, Ser. No. 194,514
Int. Cl.³ B65H *59/16*; E02B *17/00*
U.S. Cl. 405—195 **12 Claims**



1. A safety device comprising:

a wire rope, and

guyline protection means having an inside surface capable of supporting the wire rope, and

wedge means detachably supported on the inside surface of the guyline protection means, having a wire rope gripping face adjacent to but separate from the wire rope, and having an impact face adjacent to but separate from a stopping ram, and having an inclined face adjacent to but separate from wedge blocks, and

said wedge blocks mounted fixedly on the inside surface of the guyline protection means, and having an inclined surface adjacent to but separate from the wedge means, and

a stopping ram positioned around the wire rope, but between the wedge means and a clamp and

a clamp fixed to the wire rope at a predetermined distance from the surface of the wedge means, and having sufficient strength and size to activate the proximate stopping ram.

4,372,707

PILE INSTALLATION AND REMOVAL MECHANISMS IN OFF-SHORE RIGS AND METHOD OF USING SAME

John T. Ostgaard, Los Angeles, Calif., assignor to Pipe Technology Systems, Inc., Ingleside, Tex.

Continuation-in-part of Ser. No. 98,505, Nov. 29, 1979, and a continuation-in-part of Ser. No. 3,593, Jan. 15, 1979, Pat. No. 4,257,720. This application Jan. 19, 1981, Ser. No. 226,521
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—224 **12 Claims**

1. A method for anchoring off-shore rigs including a plurality of legs and a deck structure for oil and gas well exploration, said method comprising the steps of:

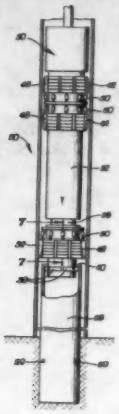
(a) transporting said rig to a selected off-shore location;

(b) positioning said rig so that said legs extend upwardly from the ocean floor and support said deck above the water level, each of said legs including at least one pile guide extending therealong, a pile contiguous with said guide and a hydraulic jack within each of said guides above the corresponding one of said piles;

(c) securing said jacks to said legs at selected locations;

(d) extending said jacks and thereby driving said piles into the ocean floor;

(e) contracting said jacks and thereby causing said jacks to move downwardly along said guides, chasing said piles;



(f) repeating steps (a) through (e) until said piles have been driven far enough into said ocean floor to have the desired load-bearing capacity.

4,372,708

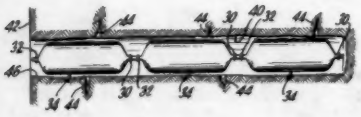
RESIN CAPSULE AND METHOD FOR GROUTING ANCHOR ELEMENTS IN HOLES OF VARIOUS LENGTHS

Arnold B. Bower, Jr., Bristol, Va., and Robert E. Dillon, Ballston Lake, N.Y., assignors to General Electric Company, Detroit, Mich.

Filed Aug. 28, 1980, Ser. No. 182,133

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **10 Claims**



1. A two component resin capsule adapted to be inserted in drilled holes of standard or non-standard lengths in conjunction with anchor bolting systems comprising:

an elongated tubular member formed from a pliable frangible material having two discrete compartments therein;

a resin component in one of said discrete compartments;

a hardener component disposed in the other of said discrete compartments; and

a plurality of pairs of sealing means disposed along the length of said tubular membrane at spaced intervals such that said tubular membrane forms a plurality of interconnected sealed capsules, whereby a variable number of said sealed capsules may be inserted into said hole, and said two component resin capsule may be severed intermediate a selected pair of sealing means to selectively obtain a sealed portion of said two component resin capsule of variable length sufficient to fill said drilled hole.

4,372,709

EXCAVATION OR TRENCHING PLATE

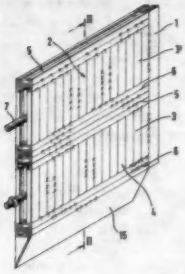
Josef Krings, Hans-Boeckler-Str. 23, D-5138 Heinsberg-Oberbruch, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,326

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1979, 7920284[U]

Int. Cl.³ E02D *17/00*

U.S. Cl. 405—282 **19 Claims**



1. An excavation support comprising a panel formed of a plurality of contiguous generally vertically oriented beams collectively defining a plurality of side-by-side vertical chambers, a generally horizontally disposed tie bar means for connecting together said plurality of beams, upper and lower generally horizontal beams spanning respective upper and lower ends of said plurality of vertical beams, opposite endmost ones of said vertical beams each having a vertical channel opening lengthwise into its respective chamber with said endmost chambers opening sidewise in opposite directions through their respective channels, another panel formed of another plurality of contiguous generally vertically oriented beams collectively defining another plurality of side-by-side vertical chambers, another generally horizontally disposed tie bar means for connecting together said another plurality of beams, another upper generally horizontal beam and another lower generally horizontal beam spanning respective upper and lower ends of said another plurality of vertical beams, opposite endmost ones of said another plurality of vertical beams each having a vertical channel opening into its respective another chamber with said another vertical beam endmost chambers opening sidewise in opposite directions through their respective channels, said first-mentioned and another panel being in generally coplanar superposed relative relationship, and means for connecting together said first-mentioned and another panels.

4,372,710

APPARATUS FOR MANIPULATING FILTER ROD SECTIONS OR THE LIKE BETWEEN PRODUCING AND PROCESSING MACHINES

Alois Kasparek, Hamburg, and Jürgen Burger, Marschacht, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,292

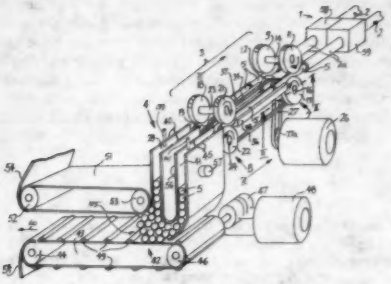
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929406

Int. Cl.³ B65G *51/02*

U.S. Cl. 406—28 **11 Claims**

1. Apparatus for manipulating rod-shaped articles between at least one producing machine and at least one processing machine, particularly for manipulating filter rod sections prior to admission into a filter tipping machine, comprising a pneumatic transporting unit having a plurality of discrete tubular conveyors for the transport of articles along separate paths, each of said tubular conveyors having an outlet for discharge

of articles in the form of a file wherein the articles move lengthwise; a separating unit including discrete sections, one for each of said tubular conveyors, and each of said sections having means for converting the respective file into a series of axially spaced articles which continue to move lengthwise, each of said converting means comprising at least one rotary article engaging and advancing element; adjustable drive means for rotating each such rotary element independently of each other rotary element so that any one of said sections can continue with or interrupt the conversion of the respective file



into a series of axially spaced articles independently of each other section; an orientation changing unit including discrete deflecting devices, one for each of said sections, each of said devices including means for changing the direction of movement of successive articles of the series of articles issuing from the respective section so that each of said series is transformed into a row wherein the articles move sideways; and means defining a common junction zone for reception of articles from said discrete deflecting devices and for conversion of the thus received articles into a stream wherein the articles move sideways.

4,372,711

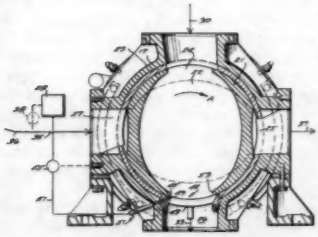
HIGH PRESSURE FEEDING

Johan C. F. C. Richter, Nice, France, and Michael I. Sherman, Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Division of Ser. No. 123,947, Feb. 25, 1980. This application Jul. 30, 1981, Ser. No. 288,487

Int. Cl.³ B65G *53/30, 53/46*

U.S. Cl. 406—63 **15 Claims**



1. A high pressure transfer device including a pocketed rotor containing a pair of diametrically through-going pockets perpendicular to each other; a housing enclosing said rotor, said housing having four ports equally spaced around the periphery thereof for registry with inlets to and outlets from said through-going rotor pockets; means for rotating said rotor in said housing with respect to said ports in a given direction of rotation; and a screen operatively associated with one of said ports of said housing for allowing passage of liquid and particles below a predetermined size in a rotor pocket therethrough, but preventing passage of particles larger than a predetermined size therethrough; and pumping means for pressurizing liquid flowing through a port opposite said port with which said screen is associated, for passing pressurized liquid into said rotor pockets; wherein the improvement comprises:

fluid injection means operatively associated with a rearmost portion of said screen, relative to the direction of rotation of said rotor, for injecting fluid to effect dislodgement of any particles that might be lodged in said screen; and means for timing said fluid injection means so that fluid is injected therethrough substantially only when a trailing edge, in the direction of rotation of said rotor, of a through-going pocket in said rotor approaches said rearmost portion of said screen.

4,372,712

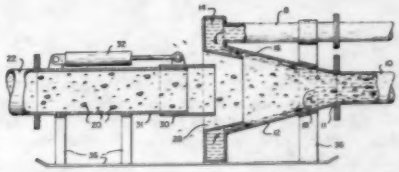
CONTINUOUS TRANSFER OF PARTICLES FROM A GASEOUS CONVEYING MEDIUM TO A LIQUID CONVEYING MEDIUM

John E. Powell, and Andrian J. C. Powell, both of Pittsburgh, Pa., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 18, 1981, Ser. No. 245,110

Int. Cl.³ B65C *53/14*; F16K *19/00*

U.S. Cl. 406—153 **8 Claims**



1. A method of continuously transferring particles from a gaseous conveying medium to a liquid conveying medium which comprises:

injecting a liquid into a cone-shaped inducer in a manner such that the liquid flows adjacent to the inducer's periphery toward its vertex;

directing a stream of the gaseous conveying medium and entrained particles through an inlet pipe into the center of the cone-shaped inducer and directed toward the inducer's vertex, thereby causing the conveyed particles to be injected into the liquid;

positioning inlet pipe so that the gaseous conveying medium can be exhausted from the inducer opposite its vertex;

exhausting the gaseous conveying medium from the inducer; and

removing the liquid conveying medium and entrained particles from the inducer.

4,372,713

BULK MATERIAL RECEIVER

James P. Kean, Jr., Maumee, Ohio, assignor to Process Control Corporation, Atlanta, Ga.

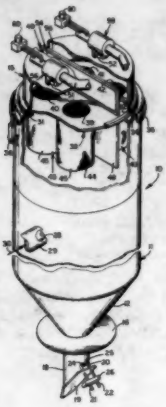
Filed Oct. 3, 1980, Ser. No. 193,741

Int. Cl.³ B65G *53/28*

U.S. Cl. 406—172 **9 Claims**

1. A bulk material receiver comprising a receiver hopper, a material inlet opening in said hopper above the lower portion of said hopper for receiving a flow of air and bulk material, a material outlet opening in the lower portion of said hopper for discharging the bulk material, at least two air openings in the upper portion of said hopper for the passage of air therethrough, a filter element mounted adjacent each air opening so as to filter the air passing through its air opening, a vacuum blower, an air exhaust conduit connected to the inlet of said vacuum blower and for communication at its other end with said air openings, valve means in said air exhaust conduit for controlling the flow of air through said air openings, said valve

means including means for placing said air openings in communication with said air exhaust conduit to direct air through the material inlet opening into the hopper and through all of said filter elements and through all of said air openings to said air exhaust conduit and for placing at least one of said air openings



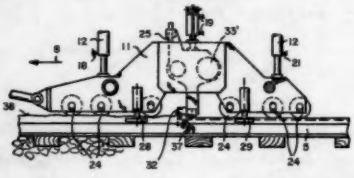
in communication with the atmosphere outside said hopper and others of said air openings in communication with said air exhaust conduit to direct air from the atmosphere through said at least one air opening and its filter element into the hopper and through the other filter element and the other air openings to said air exhaust conduit.

4,372,714

METHOD AND MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM A RAIL HEAD OF A RAILROAD TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriellgesellschaft m.b.H., Vienna, Austria

Filed May 19, 1980, Ser. No. 151,122
Claims priority, application Austria, Jan. 17, 1980, 248/80
Int. Cl.³ B23D *1/20*; E01B *31/15*
U.S. Cl. 409—293 **9 Claims**



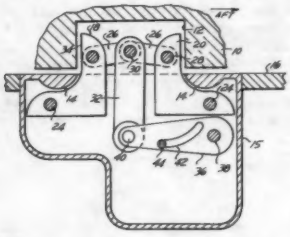
1. A method for removing such surface irregularities as ripples, corrugations and overflow metal from a rail head during and by the forward thrust of a mobile rail contouring machine, the rail head defining a gage side, a field side and a running surface, the gage and field sides extending from the running surface to a lower edge of the rail head, and the machine having a frame running on a railroad track on flanged wheels engaging the gage and field sides in a zone adjacent the running surface for continuous movement in an operating direction, the track including two rails each having said rail head and the machine comprising a rail planing tool mounting linked to the frame, guide roller means for vertically and laterally guiding the mounting along the rail head of a respective one of the rails, the guide roller means including guide rollers laterally guiding the mounting along a selected one of the rail head sides and vertically guiding the mounting along the running surface of the rail head, a rail planing tool head mounted on the mounting for lateral and vertical displacement in relation thereto, and a single rail planing tool carrying a cutting blade mounted in the tool head, which method comprises the steps of laterally pressing the mounting against the running surface and against the side of the rail head of the respective rail opposite the side thereof from which the surface irregularities are to be removed and while being guided laterally by said guide rollers in a region extending from the lower edge to below the zone adjacent the running surface, and simultaneously continuously moving the mounting along the said respective rail with a force of a sufficient thrust to plane chips or shavings off the rail head with the cutting blade and displacing the tool head in relation to the mounting during the continuous movement for engaging the cutting blade with the rail head for planing and disengaging it therefrom at the end of a planing operation.

4,372,715

PUNCH TYPE RELEASE LOCK

Faisal A. Naffa, Huntington Beach, Calif., assignor to AAR Corp., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 894,135, Apr. 6, 1978. This application May 7, 1979, Ser. No. 36,325
Int. Cl.³ B60P *7/08*
U.S. Cl. 410—79 **8 Claims**



1. Load locking mechanism for locking a movable load-carrying support in loaded position against movement in an unloading direction, in which the support has a recess at one side thereof having confronting abutment surfaces at the sides of said recess, said mechanism being located at the side of a support when said support is in loaded position, said mechanism comprising a pair of detent members having oppositely facing abutments thereon confronting the abutment surfaces in said recess when in locking position, at least one of said detent members being pivoted for swinging movement of the abutment thereon into and out of the recess, said other detent member being pivotally interconnected with said one detent member and movable therewith to cause the abutments on said detent members to swing into and out of the recess and upon movement thereof into locking position in the recess to move apart and respectively toward the confronting surfaces of the recess to provide for entry into the recess when it is not in precise registration with the locking mechanism.

4,372,716

FREIGHT BRACING BULKHEAD TROLLEY AND LATCHING SYSTEM

Bennett O. Blout, Berwyn, Ill., assignor to Evans Products Company, Portland, Oreg.

Filed Nov. 17, 1980, Ser. No. 207,421
Int. Cl.³ B60P *7/14*; B61D *45/00*; B63B *25/24*
U.S. Cl. 410—134 **7 Claims**

1. In a freight bracing bulkhead assembly comprising a bulkhead supported by a trolley system having first and second

sprocket wheels located at the opposite ends of a trolley shaft, the teeth of said sprocket wheels cooperating with apertures located in a pair of spaced, longitudinally extending overhead tracks located in a cargo area for effecting the movement of the bulkhead between selected freight bracing positions in said cargo area, said bulkhead assembly including first and second locking means supported at the opposite, upper edges of the bulkhead for movement between a locked position and a released position, said first and second locking means each including a pair of locking pins adapted to cooperate with apertures located in said tracks when said locking means are in the

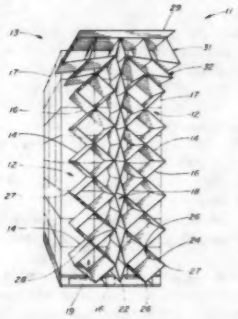
locked position, the improvement comprising locating said first sprocket wheel in the same plane as the pair of locking pins of the first locking means and locating the second sprocket wheel in the same plane as the pair of locking pins of the second locking means, said pins of each of said first and second locking means being spaced apart a distance such that, in the locked position, said pins cooperate with spaced apertures and, in the locked position, the downwardly facing of said teeth of each of said first and second sprocket wheels cooperates with an aperture located between the apertures with which said locking pins cooperate.

4,372,717

CELLULAR VOID FILLER

James D. Sewell, 5005 Yarrow Ct., Fair Oaks, Calif. 95628, and Norman E. Gordon, 7743 Claypool Way, Citrus Heights, Calif. 95610

Filed Jan. 20, 1982, Ser. No. 341,093
Int. Cl.³ B60P *7/16*; B61D *45/00*; B65G *1/14*; B32B *3/12*
U.S. Cl. 410—154 **10 Claims**



1. A structure expandable from a generally flat stack to form a cellular void filler comprising:

a. a horizontal cell row including an elongated, upper strip of sheet material overlying and coextensive with an elongated, lower strip of sheet material, said upper and said lower strips being attached at their respective end extremities and at two predetermined intermediate points to form a central, supportive cell having an upper apex, a lower apex, and opposing lateral apexes, said lateral apexes each at a respective one of said intermediate points, and a pair of generally square-shaped cells straddling said supportive cell, each of said generally square-shaped cells having an upper corner, a lower corner, an outer corner, and an inner corner, each of said inner corners located at a respective one of said intermediate points; and,

b. suspension means attached to said upper apex and said upper corners of said cell row for supporting said cell row in an expanded condition for filling a void.

2. A structure as in claim 1 further including a plurality of said horizontal cell rows stacked in vertical relation, said upper apex and said upper corners in each of said cell rows being attached to the respective said lower apex and said lower corners in the superjacent said cell row, and wherein the side dimension of said supportive cells between an apex and an adjacent lateral apex is less than the side dimension of said generally square-shaped cells between adjacent corners, the plurality of apex-connected supportive cells depending from said suspension means being effective substantially to support said plurality of said cell rows in an expanded condition, thereby maintaining said outer corners of said generally square-shaped cells in substantial vertical alignment.

4. A structure as in claim 2 wherein said suspension means includes an elongated, horizontal base strip overlying and supporting said plurality of horizontal cell rows, and in which one longitudinal edge of said base strip overlies and rests upon an adjacent stack of freight articles.

4,372,718

TAIL LAMP ATTACHMENT

Wieslaw S. Zaydel, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1980, Ser. No. 203,390
Int. Cl.³ F16B *27/00*
U.S. Cl. 411—366 **3 Claims**

1. A fastener for attaching a tail lamp assembly to a vehicle body panel having an aperture, said fastener comprising:

a stud member having a first shank portion adapted for attachment to the tail lamp assembly and a second shank portion having internal threads formed therein and a smooth outer cylindrical surface adapted for non-interfering insertion through the aperture of the panel; and

a nut member including a screw encapsulated within a molded nut, said molded nut having a bearing surface adapted to engage against the panel member and said screw having external screw threads thereon adapted for threaded engagement within the second shank portion whereby the tail lamp assembly is attached to the panel.

4,372,719

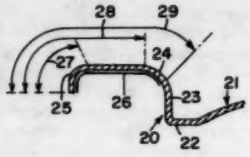
ANNEALING OF END RIM

Helmuth Supik, Sarstedt, Fed. Rep. of Germany, assignor to The Continental Group, Inc., Stamford, Conn.

Filed Jan. 21, 1981, Ser. No. 226,988
Int. Cl.³ B21D *51/00*
U.S. Cl. 413—9 **9 Claims**

1. A process for manufacturing a can end from a hard-to-deform ferrous metal wherein said can end is of the type including a chuck wall, a radially extending seaming flange and an end hook, said process comprising the steps of stamping the

can end from a hard-to-deform ferrous metal strip, annealing the area of said flange in an inert atmosphere for a period of



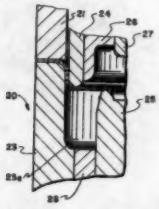
time less than two seconds, and thereafter applying to said flange a band of elastomeric sealing material.

4,372,720

FORMING OF END CLOSURES

Frank J. Herdzina, Schaumburg; Hans Kossmann, Barrington, and Harold C. Lemke, Grayslake, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Sep. 4, 1980, Ser. No. 183,977
Int. Cl.³ B21D *51/44*
U.S. Cl. 413—56 **8 Claims**



1. An apparatus for making a thin sheet of stock into a container end closure having a peripheral cover hook curl the extremity of which is inwardly tipped, said apparatus being carried in a press and having forming means carried for cooperative movement with each other and a blanked portion of said stock as at least one of said forming means is moved toward the other and wherein said forming means having at least four tool means including:

a first tool means with a shaped curved face configured like the inside cross-sectional contour of a cover hook curl,

a second tool means disposed within said first tool means and adapted for movement in one direction toward said first tool means against said blank to form the center thereof and pull the periphery of said blank over said first tool means developing a cover hook curl configuration thereacross,

a third tool means disposed between said first and second tool means and adapted to be independently positioned relative to said first and second tool means and with respect thereto for reforming said cover hook, and

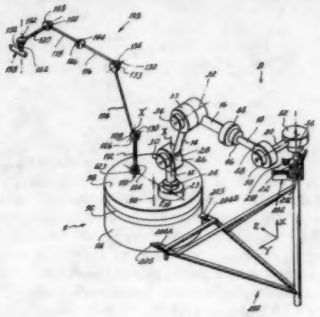
a fourth tool means positioned about said first tool means and having an internal die curling radius with the external contour and peripheral shape of said cover hook curl for receiving same and for guiding the extreme edge of the cover hook curl inwardly toward the center of the end during reforming said end closure.

4,372,721

APPARATUS FOR CALIBRATING LINK POSITION TRANSDUCERS OF A TEACHING ROBOT AND A WORK ROBOT

Martin J. Harjar, Vermilion, and Jeffrey S. Noss, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed May 18, 1981, Ser. No. 264,224
Int. Cl.³ B25J *1/00*
U.S. Cl. 414—5 **13 Claims**



1. Apparatus comprising:

a relatively massive powered work robot having a base from which extends a series of articulated links interconnected at joints to provide plural degrees of freedom, each joint having an actuator for moving the links interconnected thereat relative to each other and a position transducer for providing a signal correlated to the relative position of the links interconnected thereat, said series of links terminating in an output link,

a relatively lightweight manually manipulatable unpowered teaching robot having a base from which extends a series of articulated links interconnected at joints to provide plural degrees of freedom, each joint having a position transducer for providing a signal correlated to the relative position of the links interconnected thereat, said series of links terminating in an output link, said teaching robot links and degrees of freedom simulating those of said work robot,

means to alternatively mount said work robot base and teaching robot at the same operative position in space,

a calibration fixture including:

a stationary member having first, second, and third manually orthogonal locating surfaces,

means to mount said stationary member in a fixed spatial position displaced from said same operative position in space,

a movable member alternatively mountable to said work robot output link and said teaching robot output link, said movable member having first, second, and third mutually orthogonal locating surfaces configured to simultaneously contact said respective first, second, and third locating surfaces of said stationary member only when said movable member occupies a predetermined reference spatial position and orientation,

cam positioning means jointly associated with said movable and stationary members to cam their respective first, second, and third locating surfaces simultaneously into contact with each other to locate said movable member at said predetermined reference spatial position and orientation, and

adjustment means associated with said position transducers of at least one of said work robot and teaching robot to equalize the outputs of the respective work robot and teaching robot tranducers when their bases are located in said same operative position in space and their respective

output links are mounted to said movable member which has been located by said cam positioning means to occupy said predetermined reference spatial position and orientation.

4,372,722

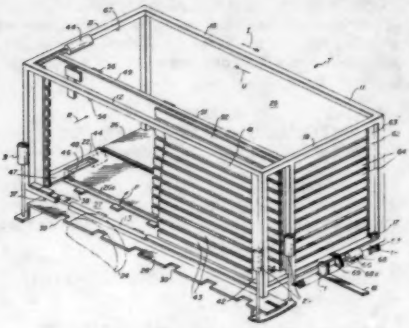
HAY BALE TRAILER

Ronald L. Van Horn, Rte. 2, Box 237, Oakley, Calif. 94561

Filed Aug. 27, 1980, Ser. No. 181,897

Int. Cl.³ A01D 87/12

U.S. Cl. 414—44 13 Claims



1. A hay bale trailer comprising, in combination, a body having an interior for the storage of hay bales, means for supporting said body for travel on the ground, a bottom wall on said body for supporting said stored hay bales, said bottom wall having a longitudinally extending opening adjacent one side of said body, shelf means mounted on said body for accommodating a row of hay bales in aligned underlying relationship with said opening, means for moving said shelf means vertically through said opening between a loading position below said opening and a stacking position above said opening to successively position a plurality of rows of bales in a vertically aligned stack in said body interior, means within said opening for retaining lowermost row of bales in said stack over said opening and means for sequentially moving said stack and successive stacks laterally from said stacking position towards the other side of said body with said stacks in side-by-side abutting relationship to store a plurality of stacks on said bottom wall within said body interior, wherein said shelf means includes a longitudinally extending platform mounted on said body in underlying aligned relationship with said opening, said platform having a substantially shovel-shaped portion on the forward end of said platform extending forwardly of said body for scooping up bales of hay successively from the ground during the travel of said body to position a row of bales on said platform.

4,372,723

AUTOMATIC BALE WAGONS

Frans J. G. C. De Coene; Adrianus Naaktgeboren, and Marc G. Vansteelant, all of Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

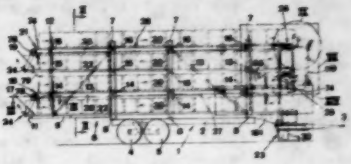
Filed Jul. 1, 1980, Ser. No. 165,153

Claims priority, application United Kingdom, Jul. 4, 1979, 7924332

Int. Cl.³ A01D 87/12; B60P 1/36

U.S. Cl. 414—111 17 Claims

1. An automatic bale wagon comprising a frame, a plurality of load floors mounted on the frame, bale pick-up means operable to pick up bales from the ground for delivery to one of the load floors, conveyor means including a first conveyor portion operable to convey bales on each load floor in a predetermined manner along a path of travel and a second conveyor portion operable to change the direction of movement of the bales at least at one point in the path of travel, bale support means movable in synchronism with the second conveyor portion to



support the bales and to maintain said bales in engagement with said second conveyor portion at the point at which a change in the direction of movement of the bales is effected, and drive means for operatively powering said conveyor means.

4,372,724

APPARATUS AND METHOD FOR STORING ROD STOCK AND SUPPLYING SAME TO A SERVICING MACHINE

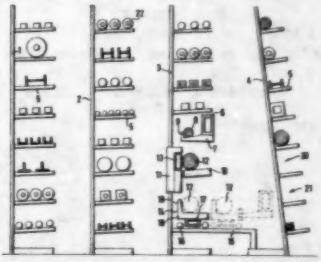
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to Stolzer Lagertechnik Gesellschaft mit beschränkter Haftung, Achern, Fed. Rep. of Germany

Filed Jun. 23, 1980, Ser. No. 162,199

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925469

Int. Cl.³ B65G 65/00; E04H 6/00

U.S. Cl. 414—281 12 Claims



1. In an installation for storing a variety of elongate rock stock with their longitudinal dimensions all extending parallel to one another in a first direction and for automatically supplying a severing machine with that stock, which installation is composed of: a plurality of generally vertically extending shelving units spaced from one another in a second direction transverse to the first direction to define gangways between adjacent units and each presenting a generally vertically spaced plurality of shelving compartments projecting from at least one side of their associated shelving unit and each arranged to hold stock having a respective cross section, each shelving compartment being formed of a plurality of carrier arms extending in the second direction and spaced from one another in the first direction; a gantry crane including a crane bridge mounted for vertical movement in the gangways and horizontal movement in the second direction, and means carried by the bridge for conveying stock to and from selected compartments; and a rollway associated with one of the shelving units and spaced vertically from the compartments of the associated unit and including rollers projecting in the second direction toward the gangway at one side of its associated shelving unit and operable for conveying stock in a generally horizontal direction to and from the severing machine; the severing machine being located outside of the region occupied by the shelving units and the crane, the improvement wherein:

said installation further comprises a stock carrier located below said rollway and provided with means defining a stock supporting surface, said carrier being movable in the second direction between a stock-receiving position located directly below said rollway and a stock-transferring position located to one side of said shelving unit associated with said rollway and in the gangway at said one side of said associated unit; and means supporting said rollway for movement between a raised position for the conveying of stock to and from the severing machine and a lowered position substantially at the level of said carrier for permitting transfer of stock from said rollway to said carrier;

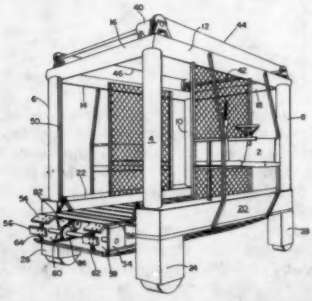
said rollway, when in its raised position, is spaced below the nearest compartment of its associated shelving unit by a distance sufficient to permit said crane bridge to be positioned directly above said rollway and beneath said nearest compartment; and

said means carried by said crane bridge, said shelving compartment carrier arms, said rollers of said rollway and said means defining a supporting surface of said carrier are constructed for permitting said means carried by said crane bridge to move vertically between said shelving compartment carrier arms and said rollers to effect transfer of stock therebetween, for permitting said rollers to move vertically between said means defining a supporting surface of said carrier to effect transfer of stock from said rollway to said carrier, and for permitting said means carried by said crane bridge to move between said means defining a supporting surface of said carrier to effect transfer of stock from said carrier to said crane bridge.

4,372,725
MULTI-WHEELED TRANSPORTER AND CONVEYING VEHICLE

Michael J. Moore, Naples, and Charles F. Studley, Jr., Arcadia, both of Fla., assignors to Good Earth Growers, Inc., Arcadia, Fla.

Filed Mar. 5, 1982, Ser. No. 355,276
Int. Cl.³ B60F *1/38*
U.S. Cl. 414—460 **10 Claims**



1. In a multi-wheel transporter vehicle of the straddle-type comprising first, second, third and fourth vertically extending corner upright members, each corner upright further comprising a wheel assembly at the lower end thereof and first drive means operable to control one or more of said wheel assemblies, the improvement comprising:

(a) a left-side longitudinally extending base unit connected between and proximate the lower ends of the first and third uprights and a right-side longitudinally extending base unit connected between and proximate lower ends of the second and fourth uprights;

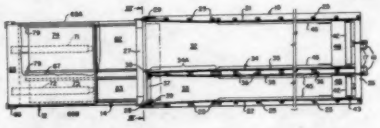
(b) a front-side transversely extending brace unit connected between and proximate the upper ends of the first and second uprights, and a rear-side transversely extending brace unit connected proximate and between the upper ends of the third and fourth uprights; and

(c) a longitudinally extending endless conveyor platform assembly including second drive means for selectively defining a linear motion in the longitudinal direction for said conveyor, between said uprights, wherein said conveyor platform is supported proximate its forward end and rearward end by third drive means operable to vertically translate said platform assembly between a first position proximate the lower end of said uprights and a second position proximate the upper ends of said uprights, thereby enabling the first and second uprights and the third and fourth uprights transversely to straddle vertically extending obstacles therebetween, while maintaining an ability to provide a longitudinal conveyance for loads superposed upon said conveyor means.

4,372,726
MATERIAL-HANDLING APPARATUS

Theodore A. Lutz, R.D. 1, Box 276, Rochester Rd., Sewickley, Pa. 15143

Filed Apr. 1, 1980, Ser. No. 136,232
Int. Cl.³ B65F *1/00*
U.S. Cl. 414—517 **12 Claims**



1. A material-handling apparatus including a container having upstanding side walls, a bottom wall and a roof wall adjoined together along the side edges thereof, said container further having a front end wall means adjoined with one end of said walls and rear door means at the other ends of said walls to form a partial end closure for the space between said side walls, hinge means to support said rear door means on one of said walls, an internal partitive wall supported by said floor wall and roof wall between said side walls for subdividing the space enclosed by said walls into two longitudinal storage compartments, each at an opposite lateral side of the internal partitive wall, latch means to retain said rear door means in closed position against part of some of said walls to define two portal openings each communicating with one of said two storage compartments for separate passage of material into each of the compartments, and a compartment door for one of said compartments to maintain material therein when said first-mentioned door is swung about said hinge means, said apparatus further including transfer means including two rams each communicating with one portal opening to separately advance material into said compartments under a compacting force, two charging chambers each having a material-receiving opening traversed by one of said rams for displacing material into a compartment of said container, means to support said transfer means for detachable connection with said container, and means for releasably clamping said transfer means to said container.

4,372,727
TRAILER INCLUDING A MULTIPLE FOLD POWERED RAMP TAIL

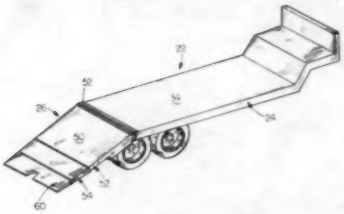
Ronald G. Fredrickson, and Joseph W. Bills, Jr., both of Mitchell, S. Dak., assignors to Dakota Manufacturing Co., Inc., Mitchell, S. Dak.

Filed Mar. 30, 1981, Ser. No. 248,972
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—537 **9 Claims**

1. A trailer comprising,

a wheeled frame means having rearward and forward ends and a

support deck for supporting a load thereon,
means on the forward end of said frame means for connecting said frame means to a prime mover,
a multiple fold ramp assembly pivotally connected to the rearward end of said frame means,
said ramp assembly comprising a main ramp portion having an upper support deck portion and rearward and forward ends and being pivotally connected at its forward end, about a horizontal axis, to the rearward end of said frame means; a first stage ramp portion having an upper support deck portion and rearward and forward ends and being pivotally connected at its forward ends, about a horizontal axis, to the rearward end of said main ramp portion; and a second stage ramp portion having an upper support deck and rearward and forward ends and being pivotally connected, at its forward end, about a horizontal axis, to the rearward end of said first stage ramp portion,
said main ramp portion being selectively pivotally movable between first and second positions, the upper support deck



of said main ramp portion being substantially horizontal when said main ramp portion is in its first position and being inclined downwardly and rearwardly with respect to said frame means when said main ramp portion is in its second position,
said upper support deck of said main ramp portion being substantially parallel to said support deck on said frame means when in its said first position,
said first stage ramp portion being selectively movable from a stored position beneath the lower rearward end of said main ramp portion to an operative position wherein its upper support deck portion is substantially parallel with the upper support deck portion of said main ramp portion,
said second stage ramp portion being selectively movable from a stored position beneath the lower rearward end of said main ramp portion to an operative position wherein its upper support deck portion is substantially parallel with the upper support deck portion of said first stage ramp portion.

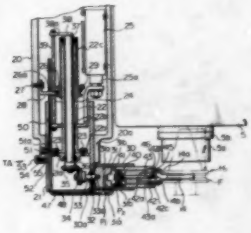
4,372,728

TOOL TRANSFER ARM ASSEMBLY FOR AUTOMATIC MILLING MACHINES

Kunio Murakami, Hamamatsu, Japan, assignor to Enshu Limited, Japan

Filed Jan. 2, 1981, Ser. No. 222,255
Int. Cl.³ B23Q *3/157*; B25J *9/00*
U.S. Cl. 414—590 **6 Claims**

1. A tool transfer arm assembly for automatic milling machines comprising
a fixed, vertically elongated, cylindrical housing having a bottom opening,
a cylindrical first shaft vertically slidably and axially turnably inserted into said housing through said bottom opening,
a cylindrical second shaft vertically and coaxially fixed within said first shaft,
an operating rod coupled, at its one end, to a first pneumatic cylinder fixed to said housing and, at its the other end, to the outer surface of said second shaft whilst allowing free axial turning of said second shaft so that operation of said first pneumatic cylinder causes corresponding vertical movement of said first and second shafts,
a pinion wheel coupled to a vertical spline formed in the outer surface of said second shaft whilst allowing free vertical movement of said second shaft,
a pinion rack operationally coupled to a second pneumatic cylinder and placed in meshing engagement with said pinion wheel so that operation of said second pneumatic cylinder causes axial turning of said second shaft without any interference by its vertical movement,
a vertically extending third shaft inserted into said second shaft by means of bearings, fixedly linked to said operating rod, and provided with a first bevel gear fixed to its bottom end,
a holding cylinder horizontally, radially and outwardly extending from said bottom opening of said housing,
a cylindrical block axially turnably inserted into said holding cylinder and fixedly carrying at its inner end a second bevel gear in meshing engagement with said first bevel gear carried by said third shaft,
an end closured fixed to the outer end of said cylindrical block so that a piston chamber is formed within said cylin-



drical block, both stroke ends of said piston chamber being connected to separate supply lines of compressed air,
a piston head encased within said piston chamber and accompanied with an outwardly extending piston rod through said end closure,
a pair of cooperating holding jaws operationally linked to the outer end of said piston rod so that axial reciprocation of said piston head causes corresponding opening and closing of said holding jaws, and
a pin fixed to said housing in sliding engagement with a cam groove formed in the outer surface of said first shaft,
said cam groove including a vertically extending first section which controls a first vertical movement of said assembly for moving a tool holder towards and away from a spindle head in a milling position, a second section horizontally extending at its one end from the upper end of said first section which controls axial turning of said assembly for transferring said tool holder between milling and stand-by positions, and a third section vertically extending upwards from the other end of said second section which controls a second vertical movement of said assembly for moving said tool holder towards and away from a socket in said stand-by position.

4,372,729

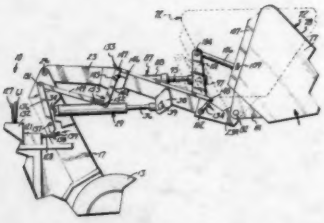
TILT CONTROL

Floyd E. Buschbom, Long Lake; Donald L. Henke, and Glen D. Hansen, both of Maple Plain, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jul. 21, 1980, Ser. No. 170,597
Int. Cl.³ E02F *3/86*
U.S. Cl. 414—700 **47 Claims**

1. A vehicle comprising: a frame having generally upright post means, wheel means operably connected to the frame to support the frame from movement on the ground, means for

driving at least one of said wheel means, lift arm means, first pivot means pivotally connecting the lift arm means to the post means, power means connected to the frame and lift arm means operable to move the lift arm means from a down position to an up position, material accommodating means, second pivot means pivotally mounting the material accommodating means on the lift arm means, expandable and contractible means connected to the lift arm means, means pivotally mounted on the lift arm means and material accommodating means and connected to the expandable and contractible means operable to pivot the material accommodating means on the lift arm means for movement between a material holding position and a dump position, means for controlling the expansion and contraction of said expandable and contractible means thereby controlling the position of the material accommodating means relative to the lift arm means, and control means operably connecting the second pivot means and expandable and contractible means, said control means being operable in response to relative movement between the lift arm means and post means and relative movement between the material accommodating means and lift arm means in a manner to maintain the material accommodating means in a material holding position



during the movement of the lift arm means between said down position and up position, said control means including a first arm, a second arm, linkage means operably connecting the first and second arms, said linkage means including lost motion means allowing the expandable and contractible means to pivot the material accommodating means from the material holding position to a dump position without affecting the operation of the means for controlling the expansion and contraction of said expandable and contractible means, said first arm being connected to and movable with the means pivotally mounted on the lift arm means, said second arm means being pivotally mounted on the post means, said second arm means having means cooperating with said means for controlling the expansion and contraction of said expandable and contractible means whereby on movement of said lift arm means said second arm is moved to actuate the means for controlling the expansion and contraction of said expandable and contractible means in a manner to control the position of the material accommodating means, said first arm being rotatable in response to movement of the material accommodating means between a first position when the material accommodating means is in the material retaining position and an over center position when the material accommodating means is in the dump position.

4,372,730

LOAD OUT PIVOTING CHUTE SYSTEM AND METHOD

Carroll H. Ladt, Paducah, Ky., assignor to Pebco, Inc., Paducah, Ky.

Filed Dec. 29, 1980, Ser. No. 221,352
Int. Cl.³ B65G 67/06
U.S. Cl. 414—786 **20 Claims**

1. A load out chute system for controlling and directing the flow of relatively large quantities of bulky material, comprising, in combination:

(a) upper chute means having a top inlet opening and a bottom discharge opening defining an upper flow path;

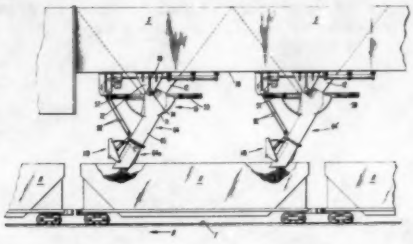
(b) lower chute means having a top inlet opening and a bottom discharge opening defining a lower flow path;

(c) first valve means for opening and closing the upper chute to control feeding of material along said upper flow path;

(d) means for pivotally mounting said lower chute means in relation to the upper chute means, whereby said lower chute means is capable of communication with said upper chute means for alignment of said upper and lower flow paths;

(e) means for pivotally moving the lower chute means into and out of communication with said upper chute means to so align said flow paths, to adjust the slide angle of said lower flow path and to store the lower chute means in a raised position; and

(f) second valve means carried by said lower chute means for



regulating the flow of material along said lower flow path in increments from full open to full closed.

20. A method for improving the efficiency of material loading facilities for directing the flow of material stored within storage means into a moving loading car, comprising the steps of pivotally lowering primary and secondary chute means into a discharge position as a loading car approaches at low velocity, fully opening gate valve means of the primary chute means as the car enters the discharge flow path, directing material through said primary chute means in rapid flow relation substantially filling said moving car, and partially opening a valve means positioned in proximity to the bottom discharge opening of the secondary chute means for incrementally adjusting and directing material in low flow relationship through said second chute means into the car, for topping off said car without significant material spillage.

4,372,731

FLUID FLOW CONTROL SYSTEM

Giusto Fonda-Bonardi, 2075 Linda Flora Dr., Los Angeles, Calif. 90024

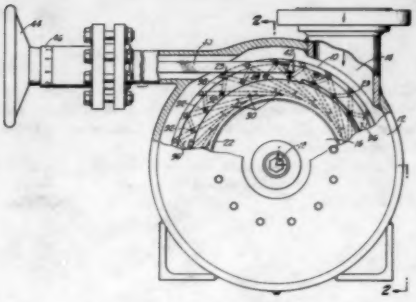
Filed Oct. 14, 1980, Ser. No. 196,923
Int. Cl.³ F03B 3/18; F04D 29/46
U.S. Cl. 415—166 **7 Claims**

1. A fluid injection control mechanism for use in conjunction with radial turbines of the type having a housing provided with a fluid inlet and a rotor rotatably mounted on an axis within the housing, said control mechanism comprising:

(a) a pair of spaced apart, axially aligned, annular shaped plates fixedly mounted within the housing about the axis thereof, said plates being provided on their opposing faces with a plurality of grooves located at circumferentially spaced intervals;

(b) a plurality of fluid flow confining elements mounted between said plates each being carried in a pair of said grooves for sliding translational movement therewithin, said elements cooperating together to define a plurality of

fluid flow channels in communication with said fluid inlet; and



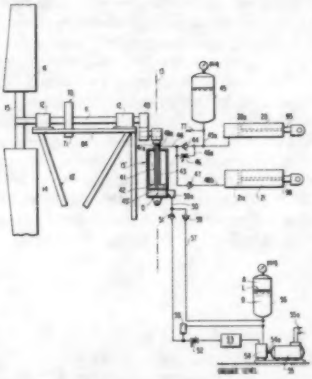
(c) control means for simultaneously translating each said fluid flow confining element equidistantly within the grooves provided in said plates.

4,372,732

CONTROL MECHANISM FOR A WINDMILL

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Filed Dec. 29, 1980, Ser. No. 221,108
Int. Cl.³ F03D 7/04
U.S. Cl. 416—14 **7 Claims**



1. A hydraulic windmill for extracting useful energy from the wind, said windmill comprising:

a carriage mounted for rotation about an axis at right angles to the axis of the wind,

means for mounting a shaft on said carriage for rotation about its axis and in the direction of the wind,

windmill blades fixed to said shaft, projecting into the wind, and being driven thereby to effect rotation of the shaft about its axis,

a tail pivoted to said carriage for rotation about an axis parallel to the axis of rotation of the carriage and remote from the blades,

a closed loop hydraulic circuit, bearing hydraulic fluid,

pump means within said hydraulic circuit and being operatively coupled to said windmill shaft to pressurize said hydraulic fluid in said closed loop circuit,

a flow impedance within said circuit including at least useful energy conversion means for operation of an end use element,

the improvement comprising:

a first hydraulic cylinder operatively coupled between said carriage and said pivotable tail,

means for connecting said hydraulic fluid circuit to said first hydraulic cylinder for directly operating said first hydraulic cylinder in response to hydraulic fluid overpressurization to rotate said tail away from its operating plane and thereby shift said blades with respect to said wind to control the maximum output power of said hydraulic windmill,

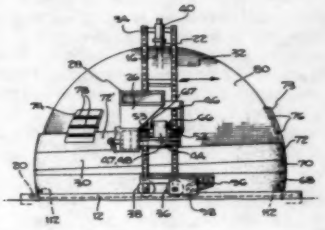
a second hydraulic cylinder operatively coupled to said hydraulic circuit for sensing a loss in minimum required hydraulic pressure within said circuit as from a leak in the hydraulic system, said second hydraulic cylinder being operatively coupled to said tail for rotating said tail away from its operating plane in response to minimum hydraulic fluid pressure within said fluid circuit.

4,372,733

BUILDING CONSTRUCTION

Robert C. Tinning, 7430 Pyramid Pl., Los Angeles, Calif. 90046

Filed Aug. 21, 1978, Ser. No. 935,114
Int. Cl.³ B29C 5/02
U.S. Cl. 425—60 **9 Claims**



1. An apparatus for constructing concrete buildings comprising:

a removable mold forming a surface of revolution having a central axis and having a form defining the desired configuration of a concrete structure;

a support post mounted at said central axis;

an assembly including a concrete dispenser and local concrete storage means for supplying concrete to said dispenser; and

means including a movable frame for mounting said concrete dispenser for movement peripherally around said mold and progressively from the bottom to the top of said mold for applying concrete in strips over substantially the entire exterior surface of said mold, to form a thick wall of concrete on the outer surface of said mold, said mounting means including means for supporting said assembly substantially independent of the concrete wall being formed.

4,372,734

APPARATUS FOR MIXING AND EXTRUDING SIMULATED MEAT MIX FOR PET FOOD

Francis H. Dolan, Ontario, and Michael S. Connor, Cobourg, both of Canada, assignors to General Foods Inc., Ontario, Canada

Division of Ser. No. 228,532, Jan. 26, 1981. This application Dec. 29, 1981, Ser. No. 335,413
Claims priority, application Canada, Feb. 6, 1980, 345155
Int. Cl.³ A22C 7/00; B29F 3/02, 3/08
U.S. Cl. 425—131.1 **6 Claims**

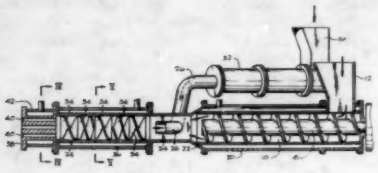
1. Apparatus for the preparation of intermediate-moisture pet food having a first ingredient phase simulating lean meat and a second ingredient phase simulating fat, blended and

shaped to resemble small cuts of lean meat marbled with fat comprising

first means for pressure-casting the first ingredient phase into an elongated ingredient receiving and blending compartment at its upstream end, and a hollow core positioned centrally within the upstream end of the compartment,

and second means of capacity smaller than the first means for pressure casting the second ingredient phase centrally into the compartment through the hollow core,

and a number of stationary baffles of generally helical configuration positioned in tandem in the compartment downstream of the hollow core,



upstream and downstream edges of the baffles being substantially straight and the downstream edge of each baffle being immediately adjacent and at an angle to the upstream edge of the following baffle,

the baffles during passage of the ingredients cutting, dividing and axially rotating substantial portions of the ingredients to randomly blend the first and second ingredient phases,

and a die block at the downstream end of the compartment through which the blended ingredients are extruded.

4,372,735

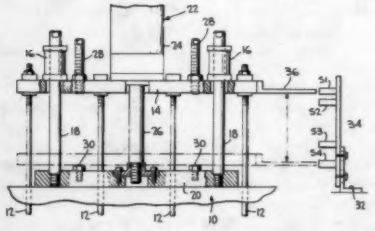
CONTROLLED FEED OF STABILIZING ROD ASSOCIATED WITH CONTROLLED APPLICATION OF BLOWING GAS

Wayne N. Collette, Westmoreland, N.H., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 2, 1981, Ser. No. 250,495

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—135 **3 Claims**



1. A blow molding apparatus of the type including a blow mold for receiving a preform and having a preform centering rod, feed means for advancing said centering rod from a retracted position to a position within and touching a preform positioned in said blow mold with said centering rod being in centering engagement with said preform, and control means for coordinating the application of blow gas with the movement of said centering rod wherein said centering rod is maintained in centering engagement with such preform while axial elongation of the preform is effected by blow gas pressure, said control means including a plurality of control switches for controlling the selective introduction of blowing gases into said preform, said control switches being spaced in the direction of centering rod movement, and switch actuating means connected to said centering rod for movement therewith and for sequentially actuating said control switches.

4,372,736

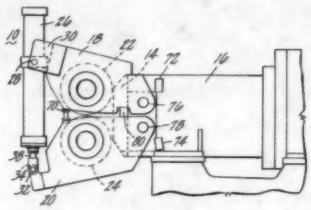
ADJUSTABLE ROLLER HEAD EXTRUSION DIE

Kendrick J. Gooch, Bethany; Hans R. Scharer, Woodbridge, and William Winter, Trumbull, all of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Feb. 17, 1981, Ser. No. 234,950

Int. Cl.³ B29H *5/24*

U.S. Cl. 425—149 **4 Claims**



1. A roller die arrangement for an extrusion machine comprising a pair of opposed rolls mounted at the output end of an extruder, pivoted pairs of arms mounting the rolls at opposite ends for rotation and for bodily swinging movements between an open condition exposing the output end of the extruder and a closed condition in which clearance between the rolls form a roller die for shaping extruded material, piston and cylinder devices acting between the arms at opposite ends of the rolls for swinging the arms between open and closed conditions, fluid pressure means including an accumulator for fluid at a predetermined pressure acting on the piston and cylinder devices to hold the rolls in closed condition under a predetermined pre-load force to maintain the clearance acting on material extruded under a normal pressure, whereby material under greater than normal pressure moves the rolls apart against the pre-load force applied by the fluid pressure in the accumulator to cause the rolls to float on the extruded material.

4,372,737

METHOD AND APPARATUS FOR FORMING A PLASTIC FLUID CONTAINER WITH AN INTEGRAL HANDLE

Kenneth P. Thompson, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 178,525, Aug. 15, 1980, Pat. No. 4,334,942.

This application Jul. 13, 1981, Ser. No. 282,791

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—393 **4 Claims**

1. Apparatus for forming a plurality of handles in a container comprising:

an upper mandrel having walls which define a generally semi-toroidal cavity extending upwardly from a bottom surface thereof,

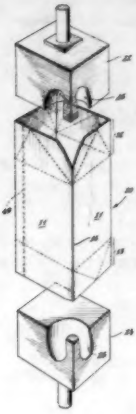
a lower mandrel adapted to mate within the interior of a container blank tube with said upper mandrel, said lower mandrel including walls which define

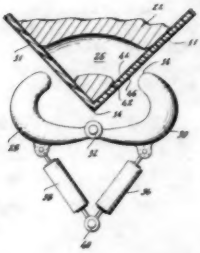
a generally semi-toroidal shaped cavity extending downwardly from the upper surface thereof, and

a pair of dies hinged to each other and rotatable with respect to each other about a vertical axis,

each of said dies having a surface shaped complementary to

the toroidal-shaped cavities in said abutted mandrels so as to deform separated portions of the carton tube into said





mandrel cavities to form a pair of handle portions on said container blank.

4,372,738

COLLET LOCK FOR A MOLD ASSEMBLY

John W. Black, Hickory Corners, and Ralph E. Slager, Portage, both of Mich., assignors to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Oct. 27, 1981, Ser. No. 315,375

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—451.9 **10 Claims**

1. In combination with a mold having two mold parts movable between an open position spaced from each other and a closed position sealingly contacting each other, a mold locking mechanism for securely clamping said mold parts in said closed position, comprising:

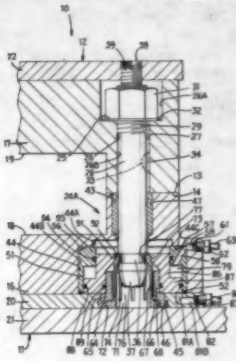
an elongate tie rod extending between said mold parts and supported on said one mold part by first mounting means, said tie rod having first locking means thereon at a location spaced from said one mold part;

second locking means provided on the other of said mold parts and cooperable with said first locking means on said tie rod for preventing lengthwise movement of said tie rod relative to said other mold part, said second locking means including a plurality of locking members disposed at angularly spaced locations about the axis of said tie rod and supported for movement toward and away from said tie rod axis between retracted and locking positions, said tie and being received between said locking members when said mold parts are in said closed position, and each said locking member, when said mold parts are in said closed position and said locking members are in said locking position, being engaged with said first locking means on said tie rod;

means for effecting movement of said locking members between said retracted and locking positions; and

selectively actuable means for resisting movement of said locking members away from said locking position,

said second locking means including a collet having a sleeve which surrounds said tie rod axis and is fixed against move-



ment relative to said other mold part in a direction parallel to said tie rod axis, said tie rod being received within said sleeve when said mold parts are in said closed position, said sleeve having therein a plurality of peripherally spaced slots extending substantially axially from one end thereof and defining a plurality of axially extending arms which are resiliently flexible in directions substantially perpendicular to said tie rod axis, each said arm having a said locking member thereon adjacent said one end of said sleeve and on the side thereof facing said tie rod axis.

4,372,739

EXTRUSION NOZZLE

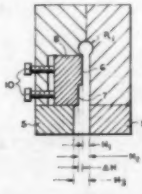
Heinz Vetter, Rossdorf, and Ernst Friederich, Darmstadt, both of Fed. Rep. of Germany, assignors to Röm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,263

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019280

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—466 **5 Claims**



1. A wide-slit extrusion nozzle having adjustable operating points comprising, a nozzle head having discharge mouth with an exit height H_3, a central supply port and a distributor channel formed therein communicated with said supply port, said distributor channel having a straight output edge and a cross-section taken from the supply port to one end of the channel corresponding to the equation

$$R_i = R_d(b/B)^{\frac{1}{3}},$$

wherein

B is the width of the distributor channel from the center of the supply port to one end of the channel;

b is a width coordinate point measured from the end of the distributor channel;

R_o is the hydraulic radius of the distributor channel at the supply port; and

R_f is the hydraulic radius of the distributor channel at the coordinate b from the end of the channel;

and at least one adjustable choker bar mounted in said head between the distributor channel and the nozzle discharge mouth, said choker bar including a damming area surface having length dimensions L_f in the direction of flow and at distances b according to the equation

$$L_f = L_o(b/B)^1,$$

wherein L_o is the length of the damming area at the supply port and

b and B are defined as above,

said damming area rising in a uniform jump ΔH of from 0.1 to 5 times the exit height H_3 above the area of the remainder of the surface of the choker bar and means for adjusting the height H_1 of the distributor channel.

4,372,740

MOLDING APPARATUS

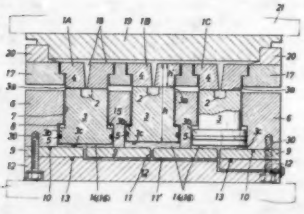
Hiroshi Kuramochi, and Ryuichi Toyoda, both of Saitama, Japan, assignors to Kokoku Rubber Industrial Company Limited, Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,370

Claims priority, application Japan, Mar. 31, 1980, 55-40199

Int. Cl.³ B29G 3/00; B29F 1/06

U.S. Cl. 425—544 5 Claims



1. Apparatus for flashless molding of parts of moldable material, comprising:

holding means;

a first plurality of first mold halves disposed in said holding means;

a second plurality of second mold halves corresponding to said first plurality;

each of said first mold halves having a first mating surface sealingly mateable with a corresponding second mating surface of one of said second mold halves;

a cavity for molding said parts in at least one of said first and second molding halves;

means for moving said second plurality of second mold halves and said first plurality of first mold halves together until at least one of said first mating surfaces contacts its corresponding second mating surface;

means for permitting displacement of each of said first mold halves in said holding means whereby all of said first mating surfaces contact their corresponding second mating surfaces;

said means for permitting displacement including seal members effective to seal a space at an end of each of said first mold halves opposed to its respective first mating surface;

passages interconnecting all of said spaces; and

a fluid filling all of said spaces and said passages whereby displacement of any first mold half produces a uniform back pressure on all others of said first mold halves tending to displace them in an opposite direction whereby all of said first mating surfaces are forced into uniform mating contact with their respective second mating surfaces regardless of dimensional inequalities in said first and second pluralities.

4,372,741

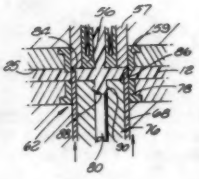
HOT SPRUE VALVE ASSEMBLY FOR AN INJECTION MOLDING MACHINE

Albert Cane, Torrance, and Mitchell P. Brown, San Pedro, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Oct. 31, 1980, Ser. No. 202,824

Int. Cl.³ B29D 17/00

U.S. Cl. 425—556 24 Claims



1. In an injection molding machine for producing centrally apertured record discs, a valve assembly for controlling flow of molten disc-forming material through a flow path defined by a generally cylindrical sprue bushing into a disc-shaped mold cavity, comprising:

valve means normally positioned in spaced relation with the sprue bushing and on a side of the mold cavity generally opposite the sprue bushing for allowing flow of the molten disc-forming material through the sprue bushing into the mold cavity, said valve means including a generally cylindrical sleeve valve movable through the mold cavity into bearing engagement with the spue bushing annularly about the flow path for preventing flow of the molten disc-forming material through the sprue bushing into the mold cavity, said valve means including means for forming a central aperture in the record disc formed within the mold cavity and for ejecting from the machine the portion of the disc-forming material displaced from said central aperture upon at least partial solidification of said portion.

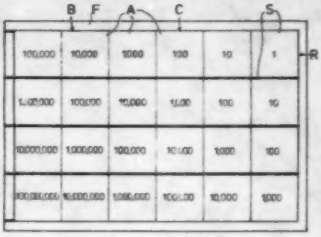
4,372,742

ARITHMETICAL TEACHING AID

Roland A. L. Wentworth, 1 Earls Ter., London W.8, 6 LP, England

Filed Oct. 21, 1981, Ser. No. 313,518
Int. Cl.³ G09B *19/02*
U.S. Cl. 434—199 10 Claims

1. An arithmetical teaching aid including a display board comprising a rectangular array of display areas arranged in columns and rows, adjacent display areas being marked to represent successive powers of an arithmetic base number so that display areas (where there are more than one) representing a given power of the base number are arranged diagonally across the board, means for relatively moving the various rows of area displays so that displays in the different rows corresponding to the same power of the base number can be brought into columnar registration, wherein all display areas corresponding to a given power of the base number have a common tonal and/or textural characteristic which is different from the characteristic of the or each neighbouring display area corresponding to a different power of the base number and wherein the teaching aid further comprises sets of unit indicators for display on said display areas each unit indicator having a tonal



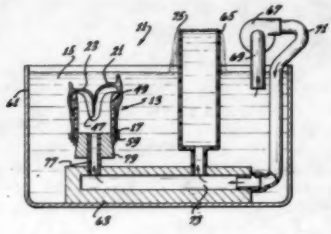
and/or textural characteristic identifiable with a said display area on which it is to be placed.

4,372,743

LOW-PRESSURE FIXATION OF VALVULAR TISSUE INTENDED FOR IMPLANTATION

Ernest Lane, Huntington Beach, Calif., assignor to American Hospital Supply Corp., Evanston, Ill.

Filed Jun. 22, 1981, Ser. No. 275,749
Int. Cl.³ A61F 1/22; C14C 3/16, 15/00
U.S. Cl. 8—94.11 11 Claims



1. A method of tanning an animal aortic valve wherein the aortic valve includes an aorta segment and valve leaflets affixed to the aortic segment, said method comprising:

subjecting the valve to a tanning fluid at a differential pressure across the valve leaflets in the range of greater than zero and no more than about four millimeters of mercury with the differential pressure being in a direction to urge the valve leaflets closed to tan the valve and to tend to distort the valve; and

mechanically restraining the valve against substantial distortion during said step of subjecting.

4,372,744

PROCESS FOR DYEING CELLULOSE MATERIALS WITH REACTIVE DYESTUFFS BY THE EXHAUSTION METHOD

Dietrich Hildebrand, Odenthal, Fed. Rep. of Germany, and Franz Haas, Dornbirn, Austria, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,053
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914111
Int. Cl.³ D06P 3/66, 5/00
U.S. Cl. 8—400 8 Claims

1. Process for dyeing cellulose fibres and textile materials containing cellulose fibres with water-soluble reactive dyestuffs by the exhaustion method, characterised in that it is carried out using dye liquors, the particular fibre-reactive reactive dyestuff content of which is less than 10% of the total content of fixed dyestuff in the end dyeing.

4,372,745

CHEMICAL LUMINESCENCE AMPLIFICATION SUBSTRATE SYSTEM FOR IMMUNOCHEMISTRY INVOLVING MICROENCAPSULATED FLUORESCER

Richard M. Mandle, Pompton Lakes, and Yuan N. Wong, Boonton, both of N.J., assignors to Electro-Nucleonics, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 105,257, Dec. 19, 1979, abandoned. This application Feb. 10, 1981, Ser. No. 233,057
Int. Cl.³ G01N 33/54, 33/58, 33/52
U.S. Cl. 436—537 47 Claims

1. A system for the detection of a biological analyte of interest which comprises a microencapsulated fluorescer material which has been conjugated to an immunological specie specific to the biological analyte of interest, a means of disrupting the capsule containing the fluorescer and an energy source other than electro-magnetic radiation which is capable of activating the fluorescer.

3. A method for the qualitative detection of a biological analyte of interest comprising:

(a) labeling an immunological specie specific to the analyte of interest with a microencapsulated fluorescer material which is biologically compatible with such specie;

(b) contacting the specie labeled by the microencapsulated fluorescer and the biological analyte of interest to form a specie labeled by a microencapsulated fluorescer/biological analyte complex;

(c) separating the specie labeled by a microencapsulated fluorescer/biological analyte complex;

(d) disrupting the capsule containing the fluorescer label thus freeing it to solution;

(e) contacting the freed fluorescer with an energy source other than electro-magnetic radiation which is capable of activating the fluorescer label; and

(f) determining the presence of chemiluminescent light emitted.

38. a microencapsulated fluorescer composition possessing a microcapsule structure having one or more reactive groups to enable the microcapsule's conjugation with an immunological specie specific to the analyte of interest.

43. A test kit for use in the detection of a biological of interest by means of an assay technique comprising, in a packaged combination, one or more containers holding

(1) a microencapsulated fluorescer material conjugated to an immunological specie specific to the biological of interest,

(2) a means for disrupting the membrane structure of the microencapsulated fluorescer, and

(3) chemical reagents capable of reacting to produce a high energy intermediate which will excite the freed fluorescer material to cause same to emit light.

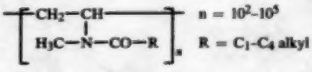
4,372,746

AGENT FOR DETECTING PEROXIDATIVELY ACTIVE SUBSTANCES AND THE USE OF A POLYVINYLMETHYLACYLAMIDE IN SUCH AN AGENT

Klaus Habenstein, Lahntal, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,731
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025372
Int. Cl.³ G01N 33/52, 33/72
U.S. Cl. 436—66 8 Claims

1. A rapid diagnostic agent for detecting, in body fluids and excreta, peroxidatively active substances, which comprises an absorbent carrier matrix containing a chromogen, a hydroperoxide, a detergent, an activator and a stabilizer, wherein the stabilizer comprises a compound of the formula I



I

or contains such a compound.

4,372,747

GLYCOHEMOGLOBIN DETERMINATION

Kenneth Gabbay, Chestnut Hill, and Paul M. Gallop, Chestnut, both of Mass., assignors to Children's Hospital Medical Center, Boston, Mass.

Filed Jul. 31, 1981, Ser. No. 288,777
Int. Cl.³ G01N 33/72, 33/66, 33/52
U.S. Cl. 436—67 7 Claims

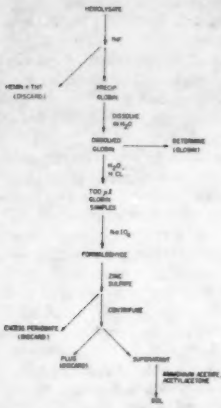
1. A method of measuring glycosylated hemoglobin comprising

providing a sample containing hemoglobin including an unknown quantity of glycosylated hemoglobin,

contacting said sample with an oxidizing agent to generate formaldehyde, and

measuring said formaldehyde as a measure of said unknown quantity of glycosylated hemoglobin,

said measuring being carried out by reacting said formaldehyde with a water-soluble amine or an ammonium salt and a β-diketone to generate a fluorescent compound, the fluorescence of which is measured as a measure of said glycosylated hemoglobin.



4. A method of measuring glycosylated hemoglobin comprising

providing a sample containing hemoglobin including an unknown quantity of glycosylated hemoglobin,

contacting said sample with tetrahydrofuran to remove hemin and precipitate globin,

contacting said globin with an oxidizing agent to generate formaldehyde, and

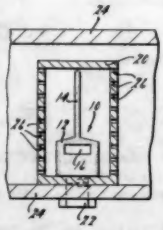
measuring said formaldehyde as a measure of said unknown quantity of glycosylated hemoglobin.

4,372,748

METHOD OF DETERMINING VEHICLE MISFUELING

John L. Bomback, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 17, 1981, Ser. No. 293,548
Int. Cl.³ G01N *31/06, 23/00*
U.S. Cl. 436—73 6 Claims



1. A method of determining if an internal combustion engine has been operated by burning a leaded fuel therein which comprises the steps of:

forming a misfueling detector from a glass material which is capable of absorbing lead when exhaust gases containing lead are passed thereover, said absorbed lead altering at least one measurable characteristic of the misfueling detector;

placing said misfueling detector in an exhaust system associated with an internal combustion engine;

allowing exhaust gases from the internal combustion engine to pass over said misfueling detector so that lead in said exhaust gases is absorbed by said detector;

removing said misfueling detector from the exhaust system associated with the internal combustion engine; and

measuring said measurable characteristic of said misfueling detector to determine whether or not said misfueling detector had absorbed lead therein while located in the exhaust system of the internal combustion engine.

4,372,749

METHOD FOR THE MANUFACTURING OF FUEL BRIQUETTES

Flemming S. Nielsen, 39, Strandparken, Himmelev, Denmark

Filed Jan. 23, 1980, Ser. No. 114,559
Claims priority, application Denmark, Jan. 30, 1979, 380/79
Int. Cl.³ C10L *5/46, 5/06*
U.S. Cl. 44—1 D 3 Claims

1. A method for manufacturing fuel briquettes from refuse, the refuse consisting of preselected components of garbage which are comminuted and mixed with coal dust to form a mixture, the mixture being compressed in a press to form a solid body, the method being CHARACTERIZED IN THAT the amount of coal dust which is added to the comminuted refuse is controlled in response to the amount of power which is drawn by a motor which drives the press.

3. The method of claim 1 wherein the press is provided with pressing wheels, the step of comminuting the refuse being performed by said pressing wheels.

4,372,750

O-ALKYLATED/O-ACYLATED COAL AND COAL BOTTOMS

Ronald Liotta, Clark, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 62,809, Aug. 1, 1979, Pat. No. 4,259,084, which is a continuation-in-part of Ser. No. 969,494, Dec. 14, 1978, abandoned, and Ser. No. 69,061, Aug. 23, 1979, Pat. No. 4,259,172, which is a continuation-in-part of Ser. No. 969,362, Dec. 14, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 213,749
Int. Cl.³ C10L *5/00, 9/02*
U.S. Cl. 44—1 R 8 Claims

1. A composition of matter selected from the group consisting of coal and coal bottoms wherein the hydrogen atom of substantially all the hydroxyl and carboxyl groups of the coal and coal bottoms, has been replaced with a group selected from the group consisting of the C_1 to C_{20} alkyl and acyl groups.

4,372,751

COAL-OIL MIXTURE APPARATUS

Wilson M. Chapman, Long Beach, and Norman L. Jensen, Jr., Irvine, both of Calif., assignors to Occidental Engineering Corporation, Irvine, Calif.

Filed Dec. 8, 1980, Ser. No. 214,366
Int. Cl.³ C10L *11/08, 1/32*
U.S. Cl. 44—2 13 Claims

12. Apparatus for producing a coal-oil mixture comprising:

crushing means including a primary, secondary and tertiary crusher for producing pulverized coal at a variable rate, said pulverizing means being disposed on a first and a second mobile platform;

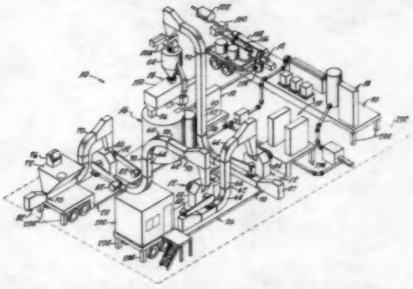
emulsifier means, adapted for connection to external water and oil supplies, for producing an oil-water emulsion at a variable rate, said emulsifier mixing means being disposed on a third mobile platform;

mixing means, interconnected with said pulverizing means

and said emulsifier means for producing a coal-oil suspension at a variable mixing rate, said mixing means being disposed on said first mobile platform, said coal-oil mixture including water and said coal being in suspension in said coal-oil mixture;

first conduit means for conveying the pulverized coal to said mixing means, said first conduit means being configured for extending between said first and second mobile platforms, said first conduit means being further configured for separation and reconnection for enabling modular transportation of the apparatus from one site to another on the first, second, and third mobile platforms;

second conduit means for conveying the oil-water emulsion to said second mixing means, said second conduit means being configured for extending between said second and third mobile platforms, said second conduit means being further configured for separation and reconnection for enabling modular transportation of the apparatus from one site to another on the first, second and third mobile platforms;



third conduit means for conveying coal interconnecting the primary, secondary and tertiary crushers, said third conduit means being configured for extending, in part, between the first and second mobile platforms, said third conduit means being further configured for separation and reconnection for enabling modular transportation of the apparatus from one site to another on said first, second and third mobile platforms; and,

control means, configured for receiving input signals corresponding to desired production rates of coal-oil mixture and in an operative relationship with said crusher, emulsifier and second mixing means, and first, second and third conduit means for varying the rate of pulverized coal production, the rate of emulsification and the mixing rate to produce said coal-oil mixture at output rates corresponding to said input signals, said control means being disposed on said first, second and third mobile platforms and including separable interconnection means between said pulverizing means, emulsifier and mixing means and said first, second, and third conduit means for enabling modular transportation of the apparatus from one site to another on said first, second and third mobile platforms.

4,372,752

FUEL FOR PISTON INTERNAL COMBUSTION INJECTION ENGINES

Jacques E. Lamy, 16, rue d'Estienne d'Orves, 92260 Fontenay-Aux-Roses, France

PCT No. PCT/FR78/00006, § 371 Date Mar. 7, 1979, § 102(e) Date Mar. 6, 1979, PCT Pub. No. WO79/00029, PCT Pub. Date Jan. 25, 1979

PCT Filed Jun. 30, 1978, Ser. No. 22,562

Int. Cl.³ C10L *1/00*

U.S. Cl. 44—50 **5 Claims**

1. A fuel designed for injection into a reciprocating internal combustion engine, said fuel consisting essentially of a stock containing light and heavy hydrocarbons present in crude oil and having the following properties:

(a) the light-hydrocarbon content is such that 10% of the volume distills at a temperature lower than about 70°–75° C., and the Reid vapor pressure is higher than 35 piezes;

(b) about 90% of the volume is collected at a temperature ranging between about 210° C. and 360° C.; and

(c) the final distillation is in the same temperature range as conventional gas-oil for current automotive engines.

4,372,753

LIQUID FUEL FOR USE IN INTERNAL COMBUSTION ENGINES

Mandayam J. Narasimhan, Jr., and Mandayam J. Thirumalachar, both of Walnut Creek, Calif., assignors to Source Technology, Inc., Minneapolis, Minn.

Filed Apr. 23, 1980, Ser. No. 143,031

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—52 **12 Claims**

1. A liquid fuel for automotive use, said fuel comprising dimethyl ketone and gasoline, wherein said dimethyl ketone is present in an amount of about 59 percent and said gasoline is present in an amount of about 41 percent.

4,372,754

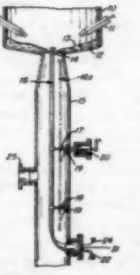
IGNITION SYSTEM FOR COAL GASIFIER

Paul Gernhardt; Wilhelm Danguillier; Karl Peter, all of Bochum; Wolfgang Grams, Herne; Siegfried Pohl, and Peter Schnitzler, both of Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum and Saarbergwerke Aktiengesellschaft, Saarbrucken, both of, Fed. Rep. of Germany, a part interest

Continuation-in-part of Ser. No. 959,819, Nov. 13, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,593

Int. Cl.³ C10J *3/68*

U.S. Cl. 48—77 **9 Claims**



1. An ignition system for a fluidized stream of finely-divided coal particles in a pressurized gasifier housing having a slag overflow pipe coupled to a discharge vessel, said ignition system including the combination of:

an ignition burner arranged in said slag overflow pipe to ignite the fluidized streams of finely-divided coal particles within said gasifier housing,

a pilot burner supported to ignite said ignition burner,

fuel supply pipe means to deliver fuel for combustion by said ignition burner and said pilot burner,

ignition means to ignite fuel delivered by said fuel supply pipe to said pilot burner,

at least one support lever supported on said slag overflow pipe by a pivot extending transversely to the extended length of said slag overflow pipe, said support lever carrying said ignition burner, ignition means, fuel supply pipe and pilot burner for movement between an operative position wherein said ignition burner is situated at the slag-receiving opening of said slag overflow pipe and an

inoperative position remote from the slag-receiving opening where said ignition burner is protected from contact by slag and radiation heating, said at least one support lever moves said ignition burner within substantially only one plane extending through the centerline of said slag overflow pipe, and

means carried by said slag overflow pipe to form a pressure-tight mechanical connection for external passage of at least one of said support levers from said slag overflow pipe.

4,372,755

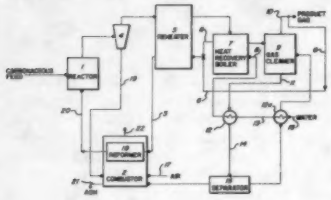
PRODUCTION OF A FUEL GAS WITH A STABILIZED METAL CARBIDE CATALYST

Radon Tolman, Evergreen, and Frank M. Stephens, Jr., Lakewood, both of Colo., assignors to Enrecon, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 928,506, Jul. 27, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,319

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R **27 Claims**



1. A process for the production of a fuel gas from a solid carbonaceous material comprising reacting in a single reaction zone the solid carbonaceous material in the presence of a stabilized metal carbide catalyst capable of substantially maintaining its physical integrity and chemical activity under gasification conditions, said catalyst comprising carbon and a metal alloy and having a free energy of formation of from −30,000 to 10,000 British thermal units per pound atom of carbon at the reaction conditions, said metal alloy comprising at least two metals selected from the group consisting of iron, silicon, manganese, cobalt, chromium, nickel, aluminum, vanadium, tungsten, molybdenum, calcium, boron, sodium and magnesium wherein one of said two metals forms a sufficiently stronger carbide to act as a stabilizing component thereby enhancing the chemical activity of the other metal carbide and a gas of which from about 10 to about 30 volume percent is selected from the group consisting of water vapor, carbon dioxide and mixtures thereof at a temperature and pressure sufficient to cause the gasification of the carbonaceous material and cause the formation of a sufficient amount of methane to produce a fuel gas wherein the temperature is from about 500° C. to about 900° C. and the pressure is from about 100 kilopascals to about 8300 kilopascals.

4,372,756

TWO-STAGE COAL GASIFICATION PROCESS

Charles M. Whitten, Brentwood; Robert H. Scott, Columbia, and Vaughn Mansfield, Gallatin, all of Tenn., assignors to Mansfield Carbon Products, Inc., Nashville, Tenn.

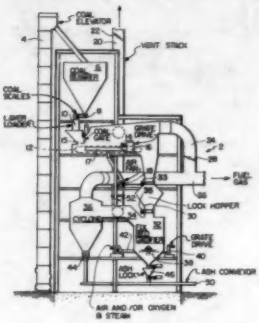
Filed Jun. 30, 1981, Ser. No. 278,992

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—202 **2 Claims**

1. A two stage process for gasifying agglomerating coal having a Free Swelling Index of from 2 to 9, volatile matter greatly in excess of 4% and consisting of more than 20% of minus ¼ of an inch, which comprises,

producing hot char with substantially no more than 15% of minus ¼ of an inch and containing no more than 12% volatile matter by carbonizing said coal in a horizontally moving bed reactor having a chamber at or only slightly above atmospheric pressure by reacting said coal with gas selected from the group consisting of air, oxygen and steam until the bed temperature is raised to between 1200° F. and 1800° F. and most of the tar and oil content of the coal is cracked to essentially carbon monoxide and hydrogen while leaving a hot char residue consisting essentially of carbon and minor amounts of volatile matter and ash,



gravity feeding said hot char through a gas lock hopper into a fixed bed reactor having a chamber disposed below and isolated from the chamber of the moving bed reactor by the gas lock hopper, said fixed bed reactor having a gas outlet conduit leading to a remote utilization device, and

reacting said hot char in the fixed bed reactor with a gas consisting of air or oxygen and steam at a pressure substantially above atmospheric pressure and sufficient to force the gaseous reaction by-product from the fixed bed reactor chamber through the gas outlet conduit to the remote utilization device.

4,372,757

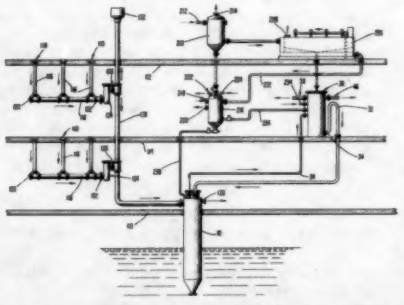
OFFSHORE PLATFORM DECK DRAINAGE

Uncas Favret, Jr., Rte. 3, Box 3880, Covington, La. 70433

Filed Jan. 27, 1981, Ser. No. 228,729

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—46 **13 Claims**



11. A method for removing oil-containing fluid from an offshore facility comprising the steps of:

collecting oil-containing fluid from a plurality of drains arranged about a deck of said offshore facility;

draining the collected oil-containing fluid to a vent stack which leads to and vents a separator for the oil of the oil-containing fluid, which separator is disposed below the

drains, and which vent stack has an outlet to atmosphere located above the drains; and

sealing against a back flow of gas from the vent stack to the drains, while permitting the flow of oil-containing fluid from the drains to the vent stack.

4,372,758

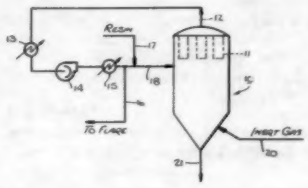
DEGASSING PROCESS FOR REMOVING UNPOLYMERIZED MONOMERS FROM OLEFIN POLYMERS

Robert W. Bobst; Billy J. Garner, both of Charleston, W. Va., and Frederick W. Jacob, Balboa, Calif., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 2, 1980, Ser. No. 183,375

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—48 **11 Claims**



1. A process for removing unpolymerized gaseous monomers from a solid olefin polymer containing said gaseous monomers which comprises:

conveying said polymer to a purge vessel in a first gas stream, said gas being inert to said polymer and monomers and containing substantially no oxygen;

feeding a purge gas to said purge vessel, said purge gas being inert to said resin and said monomers and containing substantially no oxygen;

countercurrently contacting said polymer and said purge gas in said purge vessel to produce a second gas stream containing said purge gas, said conveying gas and said gaseous monomers and a polymer stream having a reduced amount of said gaseous monomers; and

recycling a portion of said second gas stream to said purge vessel.

4,372,759

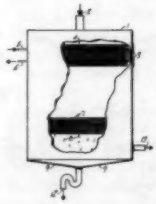
ELECTROLYTE VAPOR CONDENSER

Richard A. Sederquist, Newington; Donald F. Szydlowski, East Hartford, and Richard D. Sawyer, Canton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 28, 1981, Ser. No. 297,481

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—73 **8 Claims**



1. A method of separating electrolyte vapor from a water vapor containing gas stream in a fuel cell comprising cooling the gas stream containing the electrolyte vapor to a temperature below its vaporization temperature but above the vaporization temperature of the water, contacting the thus cooled gas stream with a high surface area passive condenser to condense the electrolyte vapor and removing the condensed concentrated liquid electrolyte from the gas stream.

4,372,760

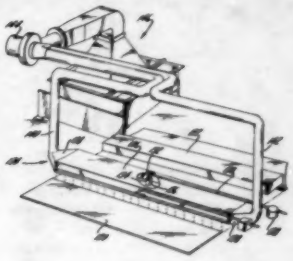
APPARATUS FOR REMOVING PARTICULATE MATTER FROM A GASEOUS STREAM

Conrad G. Van Zantwyk, Roselle, N.J., assignor to Oxy-Dry Corporation

Continuation of Ser. No. 710,642, Aug. 2, 1976, abandoned, which is a continuation of Ser. No. 461,593, Apr. 17, 1974, abandoned, which is a continuation of Ser. No. 234,891, Mar. 15, 1972, abandoned. This application Apr. 10, 1978, Ser. No. 895,115

Int. Cl.³ B01D *47/02*

U.S. Cl. 55—227 **2 Claims**



1. In an apparatus for cleaning the surface of a sheet having lightweight particulate matter thereon, such as dust, antioffset powders, and paper fuzz, which includes an ionizing means to neutralize the electrostatic forces between the particulate matter and the sheet, brush means contacting the sheet to loosen the particulate matter, a vacuum head defining a passage for collection of the particulate matter, a vacuum means to draw the particulate matter in an air stream and a particulate matter separating means for removing the particulate matter separating means including a receptacle containing a particulate matter entrapping liquid, a hood having an inlet to receive an air stream containing particulate matter and an open base and walls defining a chamber, said hood being positionable in telescoping relationship within said receptacle with the liquid level being at a spaced vertical distance of less than about $\frac{1}{2}$ inch from the open base of said hood during static conditions, so that the particles in said air stream impinge on said liquid over the surface area projected by the open base, and means for automatically maintaining the liquid at a level such that the spacing between said hood and said liquid is less than about $\frac{1}{2}$ inch during static conditions, said chamber being sized to permit expansion of the air stream introduced therein to thereby achieve substantially uniform distribution of the air stream as it exits the hood with the circumference of the open base and the spacing of the liquid level being such that the escape velocity of the air stream through the area defined by the circumference of the open base and the liquid level is less than about 3000 ft./min.

4,372,761

SCRUBBER FOR CLEANING DUST-LOADED GAS AND STEAM

Ingvald R. Lindroos, Frövi, Sweden, assignor to Rilett Energitjanst AB, Sweden

Filed Mar. 10, 1981, Ser. No. 242,233

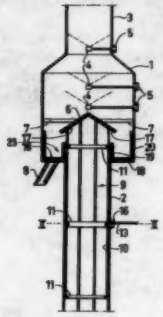
Claims priority, application Sweden, Mar. 14, 1980, 8002023

Int. Cl.³ B01D *47/06*

U.S. Cl. 55—260 **8 Claims**

1. A scrubber for cleaning dust-loaded gas and/or steam, comprising an inlet duct for the gas and/or steam and an outlet,

at least one nozzle arranged in the scrubber for atomizing a washing liquid to be distributed over the cross-section of the scrubber, a scraping device located in the inlet duct on the inside thereof, said scraping device being mounted for reciprocating rotary movement relative to the inlet duct, said scraping device including a plurality of interconnected rods in parallel



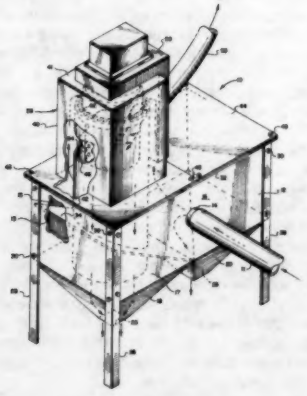
with an axial direction of the inlet duct, each of said plurality of rods being closely adjacent an inside peripheral surface of the inlet duct, said rods being only interconnected by at least one annular ring such that no portion of the scraping device in the inlet duct extends inwardly of the at least one annular ring toward the axis of the duct.

4,372,762

DUST COLLECTOR AND FILTER UNIT

Claude S. Cooley, 103 Inverness, Roanoke, Tex. 76262

Filed Feb. 9, 1981, Ser. No. 232,855
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—273 **13 Claims**



2. Apparatus for separating particulate material from an air flow stream or the like comprising:

a housing including a first member defining a first chamber in flow receiving communication with an air flow stream laden with entrained particulate material, said first chamber defining means for separating relatively coarse particles by inertial and gravitational forces acting thereon;

a first hopper in said housing in communication with said first chamber for receiving material separated from said air flow stream;

a second chamber in said housing defined at least in part by means comprising an elongated duct disposed in said housing;

a partition disposed within said first member and forming a common wall separating said first chamber from said second chamber;

a porous media filter element disposed in said part of said second chamber defined by said duct;

said housing including a second member comprising a vertically extending tower section and said duct extends from said first member into said tower section and forms generally vertically extending passage means between said second member and said duct and interconnecting said first and second chambers for conducting said air flow stream generally upward toward said second chamber from said first chamber, said passage means terminating at an inlet to said second chamber whereby said air flow stream flows generally downwardly upon entering said second chamber;

a second hopper in said housing in communication with said second chamber for receiving material separated from said air flow stream in said second chamber, said duct extending vertically downward through said partition toward said second hopper; and

conduit means in communication with said filter element for conducting relatively clean air from said housing after said air has passed through said filter element.

4,372,763

AIR FILTER ASSEMBLY

Charles L. Champlin, Rittman; John T. Misura, Wadsworth, both of Ohio, and Carl J. Reiser, Ada, Mich., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Mar. 30, 1981, Ser. No. 248,697
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—501 **4 Claims**

1. An air filter assembly comprising a compressible air pervious multi-sided filter panel, and a multi-sided frame in supporting engagement therewith and having a periphery thereof adjustable from a collapsed first mode to an operative second mode; said frame being formed from a single blank of foldable sheet material and including a foraminous substantially planar center section having a concealed surface thereof in supporting face-to-face engagement with one surface of said filter panel, the frame periphery including a marginal section delineating said center section and being substantially coplanar therewith, said marginal section having inner portions connected to said center section and outer portions to which a plurality of elongated peripheral sections are foldably connected, said peripheral sections constructed and arranged with respect to one another so as to substantially delimit said marginal section and being arranged in first and second alternate pairs, said peripheral sections constructed and arranged with each other and said marginal section to form a substantially continuous hollow verge encompassing only the periphery of said multi-sided filter panel which extends over the marginal section when said frame periphery is in said operative second mode; when said frame periphery is in said inoperative first mode, each of said peripheral sections being independently folded inwardly towards said filter panel and forming a substantially flat multiply flange overlapping peripheral portions of the filter panel and compressing same between said flange and said center section, said folded peripheral sections when said frame periphery is in said inoperative first mode being disposed within an area defined by said marginal section outer portions, each of said peripheral sections being provided with a plurality of foldably connected elongated panels, the first pair of alternate peripheral sections having opposite end portions of certain elongated panels thereof overlying corresponding end portions of certain elongated panels of the second pair of alternate peripheral sections when said frame periphery is in said first mode; the overlapped panel end portions of the second alternate pair of peripheral sections being disposed in angular abutting corner-forming relation with the adjacent panel end por-

tions of said first alternate pair of peripheral sections, when the frame periphery is in said operative second mode and restraining movement of said frame peripheral sections from said second mode to said first mode; each of said peripheral sections, when said frame periphery is in said operative second mode, having adjacent foldably connected elongated panels in angular relation and alternate panels in opposed relation; one of the panels having a substantial portion thereof affixed to an adjacent portion of the marginal section and remaining affixed thereto when said frame periphery is moved from said inoperative first mode to said operative second mode.

4,372,764

METHOD OF PRODUCING GASEOUS OXYGEN AND A CRYOGENIC PLANT IN WHICH SAID METHOD CAN BE PERFORMED

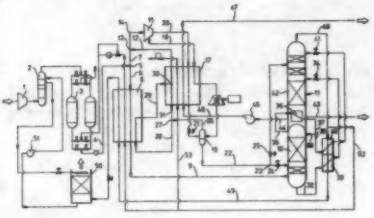
Alan Theobald, Purley, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 15, 1981, Ser. No. 283,593

Claims priority, application United Kingdom, Jul. 22, 1980, 8023899

Int. Cl.³ F25J *3/04*

U.S. Cl. 62—13 **5 Claims**



1. A method for producing gaseous oxygen which method comprises compressing feed air to between 5 and 10 bars absolute, passing said feed air through a molecular sieve adsorber to remove carbon dioxide and water vapour therefrom, fractionating the feed air in a distillation unit comprising a high pressure column operating at between 5 and 9 bars absolute and a low pressure column operating at between 1.3 and 3 bars absolute, withdrawing liquid oxygen from said low pressure column, pressurizing said liquid oxygen, vaporizing said liquid oxygen and warming the vapour, characterised in that said feed air from said molecular sieve adsorber is divided into a first stream (6), which is cooled by heat exchange against process streams and passed to the high pressure column as feed, and a second stream (7) which is compressed to an elevated pressure in a recycle compressor and is divided into a first sub-stream and a second sub-stream, said first sub-stream is cooled by said liquid oxygen and expanded to produce (on a molar basis) a mainly liquid stream which is phase separated, in which the liquid phase is introduced into said high pressure column and/or said low pressure column, and said second sub-stream is cooled, expanded in an expander, phase separated, used to assist in cooling said first sub-stream and returned, at least in part, to said recycle compressor.

4,372,765

AIR LIQUEFACTION AND SEPARATION PROCESS AND EQUIPMENT

Shoichi Tamura, Kobe; Takayoshi Asami, Ohtsu, and Hidekazu Sonoi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 26, 1981, Ser. No. 238,206

Claims priority, application Japan, Feb. 26, 1980, 55-23813

Int. Cl.³ F25J *3/04*

U.S. Cl. 62—29 **3 Claims**

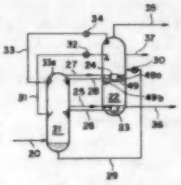
1. A method for liquefying and separating air through the use of a high pressure rectifying tower having lower, intermediate and upper heat transfer regions, a low pressure rectifying tower having lower, intermediate and upper heat transfer regions, a first evaporator disposed within said lower heat transfer region of said low pressure rectifying tower, a second evaporator disposed within said intermediate heat transfer region of said lower pressure rectifying tower, nitrogen gas and liquid nitrogen disposed within said upper heat transfer region of said high pressure rectifying tower and said low pressure rectifying tower, liquid oxygen contacting said first evaporator, liquid nitrogen contacting said second evaporator, and liquid air containing high density oxygen disposed within said lower heat transfer region of said high pressure reactifying tower, wherein said method comprises:

introducing source air into said lower heat transfer region of said high pressure rectifying tower;

channeling said source air upwards through said high pressure rectifying tower to form partially rectified air;

circulating said liquid nitrogen within said upper heat transfer region of said high pressure rectifying tower downwards so as to contact said source air throughout said high pressure rectifying tower such that said source air is separated to form said nitrogen gas disposed within said upper heat transfer region of said high pressure rectifying tower and said liquid air containing high density oxygen disposed within said lower heat transfer region of said high pressure rectifying tower;

channeling said liquid air within said lower heat transfer region of said high pressure rectifying tower to said intermediate heat transfer region of said low pressure rectifying tower;



rectifying and separating said liquid air within said intermediate heat transfer region of said low pressure rectifying tower into said nitrogen gas within said upper heat transfer region of said low pressure rectifying tower and into said liquid oxygen contacting said first evaporator within said lower heat transfer region of said low pressure rectifying tower;

communicating said partially rectified air from said intermediate heat transfer region of said high pressure rectifying tower with said first evaporator;

evaporating said liquid oxygen contacting said first evaporator with said source air;

condensing a portion of said source air within said first evaporator to form a first condensed air portion;

supplying a first part of said first condensed air portion to said intermediate heat transfer region of said high pressure rectifying tower;

supplying a second part of said first condensed air portion of said intermediate heat transfer region of said low pressure tower;

channeling said nitrogen gas, which has not traversed said first evaporator, within said upper heat transfer region of said high pressure rectifying tower into said second evaporator such that said first evaporator and said second evaporator are disposed within parallel flow paths;

condensing said nitrogen gas within said second evaporator to form liquid nitrogen;

channeling a first part of said liquid nitrogen within said second evaporator to said upper heat transfer region of said high pressure rectifying tower; and channeling a second part of said liquid nitrogen within said second

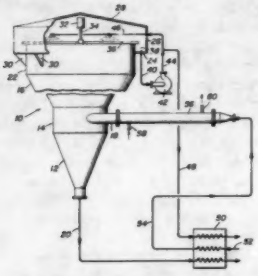
evaporator to said upper heat transfer region of said low pressure rectifying tower.

4,372,766

APPARATUS AND METHOD FOR CONCENTRATING A LIQUID MIXTURE BY FREEZING THE SOLVENT

John S. Andrepont, Downers Grove, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 16, 1981, Ser. No. 321,463
Int. Cl.³ B01D 9/02
U.S. Cl. 62—532 13 Claims



1. A freeze concentration method of separating a liquid from a liquid mixture containing a dissolved material, said liquid being less dense in solid form than in liquid form, comprising:

cooling the liquid mixture containing the dissolved material to form crystals of the liquid;

tangentially feeding the cold liquid mixture containing crystals of the liquid into the intermediate shell portion interior of a vertical vessel having a lower downwardly pointed conical shell portion, an intermediate shell portion and an upper shell portion wider than the lower and intermediate portions and with all said vessel portions surrounding and defining an unobstructed interior, so that the liquid flows in a helical path therein and then flows downwardly to and in the lower conical portion whereby a less dense liquid slurry of the crystals accumulates in the central area of the lower conical portion and flows upwardly into the vessel upper portion while a more dense liquid slurry of the crystals accumulates in the vessel lower conical portion;

withdrawing the more dense liquid slurry from the vessel lower conical portion;

collecting the less dense liquid slurry in the vessel upper portion; and

removing the crystals from the vessel upper portion.

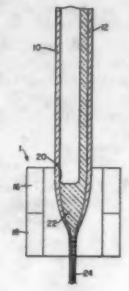
4,372,767

METHOD OF MANUFACTURING OPTICAL FIBERS

Mokhtar S. Maklad, Milford, Conn., assignor to EOTec Corporation, West Haven, Conn.

Filed Oct. 19, 1981, Ser. No. 312,539
Int. Cl.³ C03B 37/025, 37/075
U.S. Cl. 65—3.12 8 Claims

1. A process for making an optical fiber having a glass core enveloped by a glass cladding of lower index of refraction comprising, inserting a rod of the desired core glass composition into a tube made of the desired cladding composition with the rod in line contact with the inner surface of said tube, the glass transition temperature of said core glass composition being substantially lower than the glass transition temperature of said cladding composition, applying heat to said tube and rod at a temperature such that at least the lowermost portion of said rod melts and forms a film which wets the inner surface of the tube while the tube is still solid, permitting the film of melted core glass to form a melt pool at the bottom of said



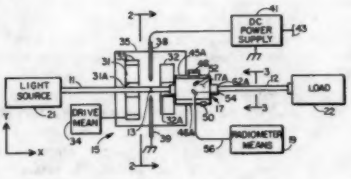
tube, and drawing said melt pool and tube into said optical fiber.

4,372,768

METHOD OF SPLICING ENDS OF OPTICAL FIBERS

Joseph Zucker, Foster City, and Arthur H. Fitch, Redwood City, both of Calif., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Apr. 27, 1981, Ser. No. 257,696
Int. Cl.³ C03B 23/20; G02B 5/14
U.S. Cl. 65—4.21 13 Claims



1. A method of splicing adjacent one ends of first and second optical fibers together comprising the steps of:

passing light in the first fiber in the direction of the one end thereof,

detecting light radiated from the perimeter of the second fiber in a length thereof that is proximate its one end and that supports substantial leaky mode light waves, and

adjusting the relative position of the one ends of the fibers for nulling the detected signal prior to operating on them for effectuating a splice therebetween.

4,372,769

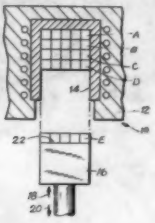
MULTI-FIBER FIBER-OPTIC ASSEMBLY METHOD

John W. Hicks, Jr., P.O. Box 345, Southbridge, Mass. 01550

Filed Jul. 20, 1981, Ser. No. 285,198
Int. Cl.³ C03B 37/14
U.S. Cl. 65—4.21 2 Claims

1. A method for assembling multi-fiber fiber optic devices in connection with an oven mold defining an opening and a piston surface for insertion to and withdrawal from said opening, comprising the steps of: assembling a single layer of multi-fibers upon said surface, heating the oven to a point where said layer will adhere within said mold, moving the surface into

said mold, and withdrawing said surface without said layer before said layer adheres to said surface.



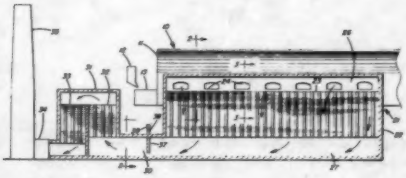
2. The invention according to claim 1, wherein the additional step of thereafter providing another layer of multi-fibers upon said surface and repeating the other steps is provided.

4,372,770

MELTING GLASS WITH TWO STAGE NO_x CONTROL

John F. Krumwiede, Blawnox, Pa., and Alan G. Amrhein, Fresno, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 31, 1981, Ser. No. 288,843
Int. Cl.³ C03B 5/16
U.S. Cl. 65—27 **10 Claims**



1. A method for controlling NO_x emissions from a process furnace in which combustion of fuel produces an exhaust gas stream including NO_x compounds, and the exhaust gas stream passes away from the furnace through passages in which exhaust gas temperatures upon entering the passages are above 1420° C. and the exhaust gas temperatures fall during passage through the passages, and the exhaust gas temperature in downstream portions of the passages fluctuate with time within and outside the range 700° C. to 1090° C., comprising injecting ammonia into the exhaust gas stream at a downstream portion of the passages when the exhaust gas temperature there is from 700° C. to 1090° C. so as to reduce NO_x compounds, and when the exhaust gas temperature at the ammonia injection location is outside the range of 700° C. to 1090° C. injecting fuel into an upstream portion of the passages at which the exhaust gas temperature is at least 1420° C. so as to consume oxygen by combustion of the injected fuel.

4,372,771

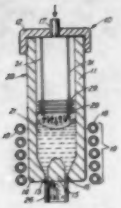
METHODS AND APPARATUS FOR EXTRUDING ARTICLES

Alexander Coucoulas, Bridgewater Township, Somerset County, and John R. Nis, Hamilton Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,466
Int. Cl.³ C03B 5/16, 37/025
U.S. Cl. 65—75 **6 Claims**

1. A method of extruding tubing from a glass melt, which comprises the steps of:

applying a gas pressure head, within a chamber containing the melt, to urge portions of said melt through an annular orifice in said chamber to form the glass tubing; while



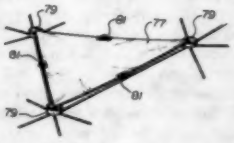
simultaneously shielding the surface of the melt with a shield that is located in close, spaced relation to the melt and the inside surface of the chamber wall to prevent any substantial evaporative loss from the melt.

4,372,772

PARABOLIC REFLECTOR COMPRISING A PLURALITY OF TRIANGULAR REFLECTING MEMBERS FORMING A REFLECTING SURFACE SUPPORTED BY A FRAMEWORK HAVING A PARTICULAR GEOMETRIC PATTERN

Douglas E. Wood, Box 32, Fox Island, Wash. 98333

Division of Ser. No. 70,914, Aug. 29, 1979, Pat. No. 4,295,709. This application Jun. 11, 1981, Ser. No. 272,576
Int. Cl.³ C03B 23/023
U.S. Cl. 65—106 **6 Claims**



1. A system for curving plane sections of glass having front and back surfaces, wherein the plane sections are first configured such that they have a triangular outline, the resulting triangular sections including vertices and edges extending between the vertices, the system further comprising:

a. means for supporting the triangular sections at each vertex thereof such that the respective vertices tend to remain in their respective positions;

b. means positioned in the vicinity of each edge of the triangular sections for forcing each edge to curve between its respective vertices, which results in the front and back surfaces of the triangular sections defining a compound curve.

5. A method for curving plane sections of glass having front and back surfaces, said method comprising the steps of:

a. configuring the plane sections of glass such that they have a triangular outline, wherein the resulting triangular sections include vertices and edges extending between said vertices;

b. supporting said triangular sections at each vertex thereof so that the respective vertices tend to remain in their respective positions; and

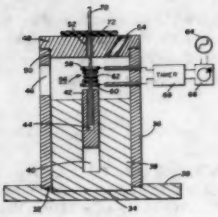
c. forcing each edge of said triangular section to curve between its respective vertices, which results in the front and back surfaces of the triangular sections defining a compound curve.

4,372,773

METHOD FOR MAKING INK JET WRITING DEVICES

Laszlo Halasz, Brecksville, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 23, 1979, Ser. No. 41,841
Int. Cl.³ C03B 23/08
U.S. Cl. 65—108 3 Claims



1. A method for forming nozzles or orifices in capillary glass tubing, comprising the steps of;

supporting a predetermined length of said tubing in an essentially vertical orientation;

heating said tubing at an intermediate location therealong until its walls soften and said tubing elongates downwardly due to gravity;

stopping elongation of said tubing upon movement of the lower end thereof through a predetermined distance;

cutting said tubing in the region of elongation to form two capillary tubes having smoothly converging nozzles;

supporting one of said two capillary tubes previously provided with a smoothly converging nozzle, in an essentially vertical position;

heating said one capillary tube at an intermediate location therealong until its walls soften and said one capillary tube elongates downwardly due to gravity; and

stopping elongation of said one capillary tube upon movement of the lower end thereof through a predetermined distance;

whereby a capillary tube having a converging-diverging inlet orifice and a smoothly converging outlet nozzle is formed.

3. A method for forming nozzles or orifices in capillary glass tubing, comprising the steps of:

supporting a predetermined length of said tubing in an essentially vertical orientation;

heating said tubing at an intermediate location therealong until its walls soften and said tubing elongates downwardly due to gravity;

stopping elongation of said tubing upon movement of the lower end thereof through a predetermined distance;

cutting said tubing in the region of elongation to form two capillary tubes having smoothly converging nozzles; and

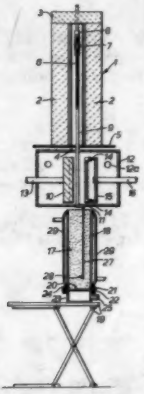
moving the lower end of said tubing laterally while its walls are soft, to form, following said cutting, two capillary tubes having bent or deflected outlet nozzles.

4,372,774

THERMAL TREATMENT OF GLASS

Raymond P. Cross, Preston, and Gordon T. Simpkin, Ormskirk, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation of Ser. No. 136,750, Apr. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 24,988, Mar. 29, 1979, abandoned, and a continuation of Ser. No. 934,727, Aug. 21, 1978, abandoned. This application Jul. 21, 1981, Ser. No. 285,447
Claims priority, application United Kingdom, Aug. 17, 1978, 33575/78
Int. Cl.³ C03B 27/00
U.S. Cl. 65—114 30 Claims



1. A method of thermally toughening glass comprising:

heating the glass to a temperature above its strain point;

chilling the hot glass by contact with a gas-fluidised particulate material which comprises a mixture in predetermined proportions of a number of selected particulate materials, at least one of which has gas-generating properties;

selecting the gas-generating particulate material from the group consisting of γ-alumina, aluminum trihydrate, aluminum monohydrate, aluminosilicate and sodium bicarbonate; and

mixing said selected particulate materials in predetermined proportions which are tailored to impart to the mixture a thermal capacity per unit volume at minimum fluidisation in the range 1.02 to 1.73 MJ/m^3K and a flowability in the range 60 to 86.

4,372,775

INHIBITION OF MICROBIOLOGICAL GROWTH WITH THIAZINE QUATERNARY AMMONIUM SALTS OF POLYEPIHALOHYDRIN

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 32,036, Apr. 23, 1979, Pat. No. 4,316,007. This application Jun. 9, 1981, Ser. No. 271,895
Int. Cl.³ A01N 43/02, 43/84
U.S. Cl. 71—67 9 Claims

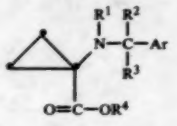
1. A process of inhibiting microbiological growth which comprises treating a hydrocarbon or aqueous system with a microbiocidally effective amount of a thiazine quaternary ammonium salt of polyepihalohydrin wherein the nitrogen atom of the thiazine moiety is attached to the polymeric chain through a $—CH_2—$ group.

4,372,776
COMPOUNDS FOR THE LOOSENING OF FRUIT AND/OR LEAVES ON PLANTS

Janet A. Day, Sittingbourne, and Robert J. G. Searle, Rodmersham Green near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 16, 1981, Ser. No. 312,039
Claims priority, application United Kingdom, Nov. 5, 1980, 8035442
Int. Cl.³ A01N 43/10, 53/00; C07C 69/74, 121/78
U.S. Cl. 71—90 2 Claims

1. A compound of the formula



wherein R^1 and R^3 each is hydrogen or together form a second carbon-to-nitrogen bond, R^2 is hydrogen or cyano, R^4 is alkyl of one to three carbon atoms, and Ar is thienyl, furyl, or phenyl optionally substituted by one or more of halogen, cyano, nitro, hydroxy, alkyl or alkoxy.

2. A method for loosening fruit and/or leaves on a plant, comprising applying to the plant or part thereof an effective amount of a compound of claim 1.

4,372,777
FLOWABLE HERBICIDES

Francis J. LeClair, Webster Groves, and John M. Surgant, Clayton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 102,182, Dec. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 957,125, Nov. 3, 1978, abandoned. This application Jan. 8, 1981, Ser. No. 223,508
Int. Cl.³ A01N 25/02, 25/00
U.S. Cl. 71—93 8 Claims

1. Flowable solid herbicides having the following composition by weight:

(a) from 25% to 50% of propachlor herbicide;

(b) from 0 to 15% of atrazine;

(c) an emulsificer/suspension system comprising:

(i)	hydrated amorphous silicon dioxide,	2–8%
(ii)	poiyoxypropylene/polyoxyethylene block copolymer, having an average mol. wt. of 6500,	2–8%
(iii)	alkyl phenoxy polyoxyethylene ethanol, and	0–5%
(iv)	hydrated aluminum silicate	0.5–2%
(d)	an inert, low-freezing point polyglycol solvent compatible with components (c) (i)–(iv)	5–15%
(e)	flocculent	0–3%
(f)	defoamer, and	0–0.1%
(g)	water,	30–70%

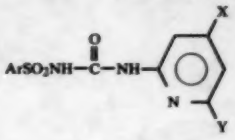
the solid components of said composition having a particle size no greater than about 25 microns.

4,372,778
HERBICIDAL N-(PYRIDINYLAMINOCARBONYL)BENZENESULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 192,034, Sep. 29, 1980, Pat. No. 4,293,330, Continuation-in-part of Ser. No. 82,522, Jun. 9, 1979, abandoned. This application May 29, 1981, Ser. No. 268,196
Int. Cl.³ C07D 213/28, 401/12, 409/12; A01N 43/40
U.S. Cl. 71—94 12 Claims

1. A compound of the formula:

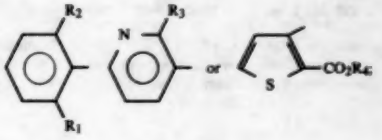


wherein

X is CH_3—, CH_3CH_2— or CH_3O;

Y is CH_3—, CH_3CH_2—, CH_3O—, CH_3CH_2O—, Cl, Br or F;

Ar is



R_1 is R_5SO_2— or $R_6R_7NSO_2$—;

R_2 is H, Cl or CH_3;

R_3 is Cl;

R_4 is C_1–C_4 alkyl, C_3–C_4 alkenyl, $ClCH_2CH_2$— or $CH_3OCH_2CH_2$—;

R_5 is C_1–C_4 alkyl;

R_6 and R_7 are independently CH_3— or CH_3CH_2—.

9. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

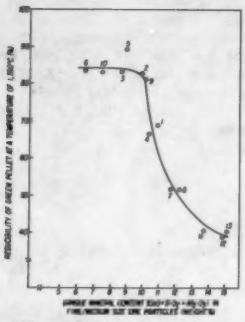
4,372,779
IRON ORE PELLETS CONTAINING COARSE ORE PARTICLES

Takeshi Sugiyama; Shoji Shirouchi; Osamu Tsuchiya, all of Kobe; Mamoru Onoda, Miki; Atsuko Yamashita, Kobe; Isao Fujita, Kobe, and Nobuyuki Imanishi, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Oct. 7, 1980, Ser. No. 194,842
Int. Cl.³ C22B 1/14
U.S. Cl. 75—0.5 R 3 Claims

1. Iron ore pellets containing coarse iron ore particles, said pellets comprising iron ore powder having a particle size distribution consisting of 25–40 wt.% of coarse ore particles greater than 0.1 mm in diameter, less than 20 wt.% of particles greater than 1 mm in diameter; less than 21 wt.% of medium ore particles of 0.1–0.04 mm in diameter; and more than 39 wt.% of fine ore particles smaller than 0.04 mm in diameter; wherein

the basicity (CaO/SiO_2) of the total amount of said fine and medium ore particles is greater than 1.0 and the gangue mineral



content ($CaO+SiO_2+Al_2O_3$) in the total amount of said fine and medium ore particles is less than 10 wt.%.

4,372,780

PROCESS FOR RECOVERY OF METALS CONTAINED IN PLOMBIFEROUS AND/OR ZINCIFEROUS OXIDE COMPOUNDS

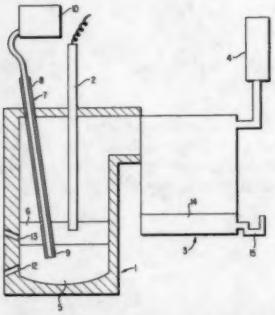
Bertrand Madelin, 1, avenue Albert Einstein, 78190 Trappes, France

Continuation of Ser. No. 57,171, Jul. 13, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,304

Claims priority, application France, Jul. 13, 1978, 78 20933

Int. Cl.³ C22B *4/04, 7/02, 13/02, 19/04*

U.S. Cl. 75—14 **23 Claims**



1. Process for the recovery of lead and zinc contained in oxidized lead and zinc products, comprising injecting said products, after drying, into a bath of molten pig iron having a temperature below about 1500° C. and condensing the released gasses thus allowing the lead and zinc to be recovered in metallic form.

4,372,781

METHOD AND APPARATUS FOR TREATING EUTECTIC AND EUTECTOID COMPOSITIONS

Ermano Bo, Chemin de Monte-Ferrand Ternay, St Symphorien d'Ozon, France (69360), and Tadeusz G. Mathia, Allee des Chenes, Charbonnieres-les-Bains, France (69620)

Filed Nov. 14, 1980, Ser. No. 206,951

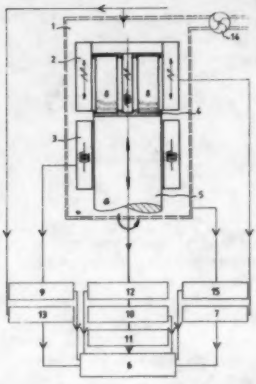
Claims priority, application France, Feb. 26, 1980, 80 04496

Int. Cl.³ C22C *1/02*

U.S. Cl. 75—65 ZM **20 Claims**

1. A process for the preparation of anisotropic metallic compositions which is adapted to achieve floating zone melting of eutectics and orientation of eutectoids as well as melting, frittering, or homogenization of a composition prior to orientation, said process comprising:

(a) solidifying a eutectic by providing a temperature gradient and simultaneously displacing the solidification front of said eutectic along the direction of said gradient, so that a solid eutectic is obtained having a fibrous or lamellar structure oriented along a predetermined growth direction;



(b) imposing a direction of growth on said eutectic so as to orient said eutectic;

(c) preparing said eutectic by placing it within a container and treating the surface of said eutectic in a gaseous atmosphere within said container; and

(d) compacting said eutectic by moving said eutectic.

4,372,782

RECOVERY OF LEAD AND SILVER FROM MINERALS AND PROCESS RESIDUES

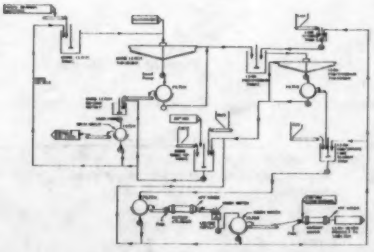
Robert S. Salter; Roy S. Boorman, and Ross D. Gilders, all of Fredericton, Canada, assignors to Provincial Holdings Ltd., Fredericton, Canada

Filed May 20, 1981, Ser. No. 265,268

Claims priority, application Japan, Oct. 9, 1979, 54-130536

Int. Cl.³ C01G *21/22;* **C22B** *7/00, 13/00, 11/00*

U.S. Cl. 75—118 R **46 Claims**



2. In a process for gaining lead and silver values comprising the steps of (1) preparing a solution of lead chloride and silver compounds by dissolving lead sulphate and silver compounds contained in an ore or process residue in an acidic, concentrated chloride brine; (2) separating the solution so formed from insoluble gangue or other residue; (3) forming a precipitate of lead oxychloride and silver compounds by adding lime to said solution and separating said precipitate from the resid-

ual lean brine solution for recycling said lean brine for reuse in the further extraction of lead sulphate as under steps (1) and (2); the improvement which comprises (5) reacting the said oxychloride precipitate with oxygen and lime in a reactor at a temperature above 325° C. for longer than one half hour to produce a calcine containing most of the lead as calcium plumbates and/or lead oxides and most of the silver as silver or silver compounds; (6) repulping said calcine in water and/or dilute chloride brine to dissolve soluble chlorides; (7) separating the residue obtained in step (6) from the resulting chloride brine; (8) recycling the brine resulting from (7) for reuse in the further extraction of lead sulphate as under steps (1) and (2); (9) washing said residue containing calcium plumbates and/or lead oxides, as well as silver and silver compounds resulting from step (7) with fresh water to remove residual chlorides; and (10) recycling the chloride brine obtained in step (9) to step (6) and/or recycling the said chloride brine for reuse in the further extraction of lead sulphate as under steps (1) and (2).

27. A process according to claim **2** wherein silver is recovered by cementation on one of metallic zinc, iron, or lead between step (2) and step (3).

4,372,783

ELECTRICAL CONTACT COMPOSITION FOR A VACUUM TYPE CIRCUIT INTERRUPTER

Masaru Kato, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1980, Ser. No. 172,484
Claims priority, application Japan, Jul. 27, 1979, 54-96468
Int. Cl.³ B22F *3/00*
U.S. Cl. 75—246 **7 Claims**

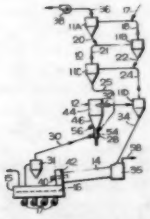
1. In an electrical contact for a vacuum type circuit interrupter comprising a principal phase material selected from a group consisting of chromium copper solid solution, iron copper solid solution, cobalt copper solid solution, and copper; and a second phase material selected from a group consisting of chromium, iron and cobalt and dispersed into the principal phase material, the improvement characterized by: the particle diameter of the second phase material being in a range of from 74 μm to 250 μm.

4,372,784

METHOD FOR HEAT TREATING PULVEROUS RAW MATERIAL CALCINING COMBUSTOR THEREFOR

Paul D. Hess, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 21, 1981, Ser. No. 295,218
Int. Cl.³ C04B *7/02*; F27B *15/00, 7/02*
U.S. Cl. 106—100 **22 Claims**



19. A method of heat treating cement raw meal in an upright calcining combustor vessel of a rotary kiln cement manufacturing plant having a cooler for clinker from the kiln comprising:

feeding combustion air from said cooler which is not admixed with waste gases from said kiln into the lower portion of said vessel and simultaneously withdrawing gas in a tangential, outwardly spiraling direction from adjacent the top of said vessel to create upwardly swirling flow of said combustion air within said vessel,

directing said cement meal into said rising combustion air within said lower portion of said vessel at a point downstream from the combustion air inlet so that said meal is entrained in said rising combustion air,

injecting fuel into the upwardly rising air/meal stream at a point within said vessel downstream from entrance of said meal and burning said fuel with said combustion air to calcine said meal, whereby the endothermic reaction of calcining said cement meal limits temperature rise within said vessel resulting from burning said fuel with said combustion air, and

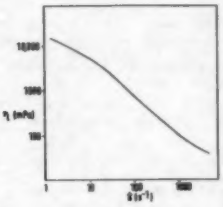
decreasing the velocity of the upwardly swirling combustion air/meal stream at a point downstream from injection of fuel to thereby increase the residence time thereof within said vessel for calcination of said meal.

4,372,785

SUSPENSIONS AND GELS OF INDICAN AND THEIR USES

Christopher J. Lawson, Reading, and Kenneth C. Symes, Wokingham, both of England, assignors to Talres Development (N.A.) N.V., Netherlands Antilles

Division of Ser. No. 126,311, Feb. 29, 1980, Pat. No. 4,338,432.
This application Mar. 3, 1982, Ser. No. 354,210
Claims priority, application United Kingdom, Mar. 6, 1979, 7907786
Int. Cl.³ C08L *1/08, 5/00*
U.S. Cl. 106—170 **14 Claims**



1. A method of modifying the viscosity of a liquid by incorporating therein an effective amount of indican, a polysaccharide comprising (1→3) glucose, (1→4) mannose, (1→4) rhamnose and (1→3 or 4) -O-(1-carboxyethyl)- rhamnose units in a molar ratio of about 2:1:1–2:1 respectively, containing 12–15% by weight acetyl units, $[\alpha]_D^{20}$ about −61°, having principle absorption bands in the infra red band at 3390, 1735, 1615, 1375, 1250 and 1050 cm^{-1}, a solubility of at least 1% by weight in methanol and in ethylene glycol, and an inherent viscosity of about 33.5 dl/g.

4,372,786

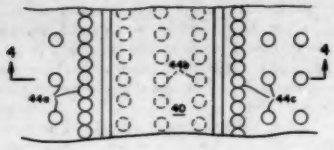
STABILIZING CLAY SOIL WITH CHEMICAL SOLUTIONS

Marion G. Reed, Hacienda Height; Tor Loken, and Odd R. Bryhn, both of Oslo, Norway, assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 9, 1981, Ser. No. 281,799
Int. Cl.³ C09K *3/00*
U.S. Cl. 106—900 **10 Claims**

1. A method of stabilizing quick clay and salt clay soil comprising admixing the quick clay and salt clay soil with an effective amount of a solution of chemicals comprising hydroxy-aluminum and a chemical selected from the group con-

sisting of potassium chloride, potassium nitrate, potassium sulfate, ammonium chloride, ammonium nitrate, and ammonium sulfate, said solution having a concentration of at least 4 molar.

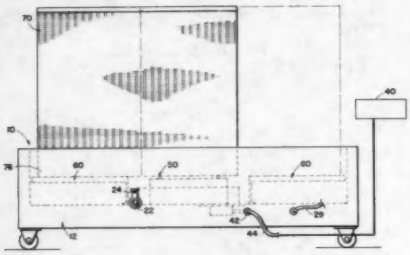


4,372,787

METHOD FOR ULTRASONIC CLEANING OF RADIATORS

John T. Fields, and Cecil D. Lee, both of 810 E. 6th St., Tulsa, Okla. 74120

Filed Jul. 6, 1981, Ser. No. 280,908
Int. Cl.³ B08B 3/12
U.S. Cl. 134—1 3 Claims



1. A method of cleaning a radiator having a header portion supporting heat exchanger tubes and comprising the steps of:
(a) heating a reservoir of cleaning liquid;
(b) impressing ultrasonic energy into the cleaning liquid with at least one ultrasonic energy producing means at an energy sufficient to cause cavitation of the cleaning liquid;
(c) supporting said radiator in the reservoir so that the header portion is immersed in the cavitated cleaning liquid and disposed in spaced relationship with the ultrasonic energy producing means;
(d) orienting the header portion in the cleaning liquid in a direction toward the ultrasonic energy producing means whereby the header is in closer proximity to the ultrasonic energy producing means than the remaining portions of the radiator; and
(e) maintaining the header portion of the radiator in the cavitated cleaning liquid for a time sufficient to effect cleaning thereof.

4,372,788

GRILL AND OVEN CLEANER

Albert J. Lancz, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,736
Int. Cl.³ B08B 3/10
U.S. Cl. 134—4 4 Claims

1. The method of cleaning soiled grill and oven surfaces comprising coating the soiled surfaces at room temperature with a composition comprising from 1 to 20% by weight of monoethanol amine, from 0.01 to 2.0% by weight of nonionic or anionic surfactant, from 0.1 to 2.5% by weight of a polyol polyether thickening agent, and sulfuric acid in a sufficient amount such that the composition has a pH less than about 10.5, heating the coated surfaces to loosen the soiling material, and rinsing the loosened soiling material away.

4,372,789

DIRECTIONALLY STRENGTHENED COPPER ALLOY PARTS FOR A GAS TURBINE

Joseph J. Jackson, Westchester, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1980, Ser. No. 176,191
Int. Cl.³ C22F 1/08
U.S. Cl. 148—3 10 Claims

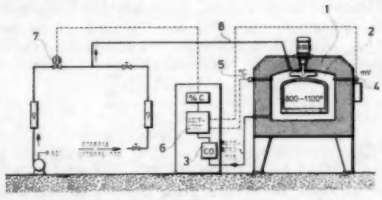
1. A directionally strengthened part for a gas turbine, which part is composed of a precipitation strengthened copper-based alloy having high thermal conductivity and a crystalline grain structure characterized by elongated grain boundaries parallel to the direction of principal stress applied to such part when in turbine service and by substantially no grain boundaries transverse thereto.

4,372,790

METHOD AND APPARATUS FOR THE CONTROL OF THE CARBON LEVEL OF A GAS MIXTURE REACTING IN A FURNACE CHAMBER

Werner Göhring, Kleve, Fed. Rep. of Germany, and Cornelius H. Luiten, Nijmegen, Netherlands, assignors to Ipsen Industries International GmbH, Kleve, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,375
Claims priority, application Switzerland, Mar. 21, 1978, 3114/78
Int. Cl.³ C21D 1/48
U.S. Cl. 148—16.5 1 Claim



1. A method for control of the carbon level of a gas mixture reacting in a heat treatment furnace, comprising the steps of

introducing a fuel containing hydrocarbon as a combustion gas as well as air into a furnace chamber to form a gas mixture by feeding exclusively flow streams of the combustion gas and the air into the furnace chamber, respectively, with the reaction products of the gas mixture not being in a state of water-gas equilibrium and not in a state of methane gas equilibrium and which gas mixture contains an excess of methane so as to assure an adequate supply of carbon,

determining the controlled carbon level from measurement of the portion of the gas component CO which is present in the furnace chamber as a first measured value, from measurement of the electrical voltage of an oxygen-ion-conducting solid body electrolyte as a second measured value and from the furnace chamber temperature as a third measured value by feeding the three measured values to a computer and determining therein the carbon level from the three measured values, and

controlling the carbon level dependent on this determination by changing the quantity flow of the combustion gas and/or of the air introduced into the furnace chamber until correspondence of the determined carbon level with its desired value is produced.

4,372,791

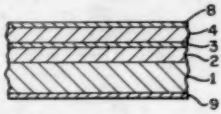
METHOD FOR FABRICATING DH LASERS

Jaw J. Hsieh, Burlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 34,116, Apr. 30, 1979, Pat. No. 4,287,485, which is a continuation of Ser. No. 816,402, Jul. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 758,733, Jan. 12, 1977, abandoned. This application Aug. 28, 1981, Ser. No. 297,195

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 4 Claims



1. A method for fabricating a diode suitable for use in a double-heterostructure diode laser comprising depositing, in sequence, upon an InP substrate having a relatively smooth surface, an active layer of $Ga_xIn_{1-x}As_yP_{1-y}$ having a thickness of below about 0.5 μm and an InP barrier layer and thereafter applying ohmic contacts to said substrate and said barrier layer.

4,372,792

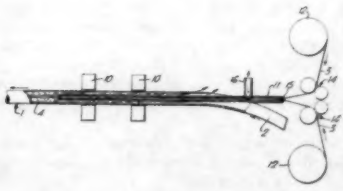
MANUFACTURE OF A FLEXIBLE STRANDED OPTICAL FIBER BODY

Philip Dey, New Barnet; Bernard Gaylard, Hale, and David A. Taylor, Kenton, all of England, assignors to BICC Limited, London, England

Filed Oct. 15, 1981, Ser. No. 311,558

Int. Cl.³ H01B *13/06;* G02B *5/16*

U.S. Cl. 156—48 19 Claims



1. A method of manufacturing a flexible stranded body comprising a substantially circumferentially rigid central core of metal or metal alloy having an elongate compartment within and extending throughout the length of the core, at least one optical fibre loosely housed in, and of a length substantially greater than that of, the elongate compartment, and, surrounding the central core, at least one layer of helically wound bare elongate elements of metal or metal alloy, which method comprises causing a preformed elongate member of metal or metal alloy of approximately U-shaped transverse cross-section to travel in the direction of its length; feeding into the space bounded by the U-shaped elongate member at least one optical fibre in such a way that the rate of advance of the fibre is restrained; transversely folding the advancing U-shaped elongate member in such a way as to form a substantially circumferentially rigid central core having a closed elongate compartment within and extending throughout the length of the core in which the advancing optical fibre is loosely housed; injecting water-impermeable medium of a grease-like nature into the elongate compartment under a controlled pressure, the consistency of the greasy water-impermeable medium, the pressure and rate at which it is injected into the compartment and the degree of restraint imparted to the advancing optical fibre being such that, in a predetermined length of the stranded body, the length of the optical fibre exceeds the length of the elongate compartment by a controlled extent and the space within the elongate compartment not occupied by the optical fibre is substantially filled with water-impermeable medium in a greasy state; and applying around the central core so formed at least one layer of helically wound bare elongate elements of metal or metal alloy.

4,372,793

METHOD OF JOINING FLEXIBLE FASTENER STRIPS TO FLEXIBLE WEB

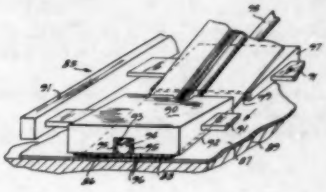
Andre M. Herz, Nesles-la-Vallee, France, assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation of Ser. No. 737,141, Oct. 29, 1976, Pat. No. 4,341,575. This application Nov. 24, 1981, Ser. No. 324,582

Claims priority, application France, Nov. 3, 1975, 75 33593

Int. Cl.³ B30B *3/02;* B29D *7/02*

U.S. Cl. 156—66 17 Claims



1. A method of attaching to a prefabricated flexible web a first prefabricated flexible separable plastic fastener strip having an interlocking profile projecting in a direction away from an oppositely facing interface surface area of the strip, and the profile being adapted for interlocking with a complementary second flexible separable fastener profile, comprising:

guiding the web and the fastener strip travelling at the same high speed and continuously in operation convergently toward one another and joining said interface surface area of the fastener strip to an interface surface area of said web;

utilizing said profile as guide means for guiding the fastener strip in movement into said convergence with said web;

continuously in operation applying a thin layer of quickly tacky adhesive to at least one of said interface surface areas as close as practicable to the convergent joining of the web and strip so that the adhesive will reach the joining while tacky, and effecting said applying of the adhesive in a manner assuring that the adhesive will be adheringly effective on the interface area of the fastener strip directly back of and aligned with said profile;

and pressing said strip and said web together and thereby effecting attachment of said interface surface areas to one another by means of the adhesive layer while the web and fastener strip continue travelling jointly at said high speed.

4,372,794

PLASTIC PAR LAMP CONSTRUCTION

Irving Bradley, Novelty, and Vincent Vodicka, South Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 61,912, Jul. 30, 1979, Pat. No. 4,336,578. This application Jun. 18, 1981, Ser. No. 275,063

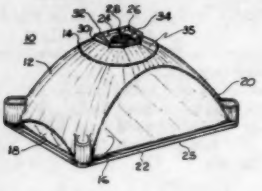
Int. Cl.³ B29C *27/08;* H01K *1/30*

U.S. Cl. 156—73.1 4 Claims

1. A method of assembling a prefocused light source mount to a plastic reflector member of a rectangular shaped reflector lamp, said reflector member having a parabolic cavity with one pair of opposing generally parallel sides and a second pair of shorter generally parallel sides to form said rectangular shape, receptacle means for a prefocused light source mount disposed on the rear side of said reflector member, and with said reflector member having a greater wall thickness in the apex region

of said parabolic cavity in a circular area commencing at the edge of the receptacle means and extending radially outward therefrom to avoid mechanical and heat deformation when the prefocused mount is sealed to said reflector member as well as during subsequent lamp operation, which comprises:

(a) assembling said light source mount to the receptacle means of said reflector member so that the light source is positioned at the focus of said reflector,



(b) mechanically securing the light source mount while the reflector member of said assembly is free to move, and

(c) ultrasonically vibrating the reflector member until a leak-proof seal has been formed between abutting surfaces of the light source mount and the reflector member.

4,372,795

METHOD FOR THE MANUFACTURE OF A COUPLING OR CLUTCH ELEMENT

Klaus Brunsch, Weidach; Claus-Michael Herkert, Zorneding, and Dieter Thomamueller, Bruckmuehl, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,776

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041064

Int. Cl.³ B32B *31/04*

U.S. Cl. 156—155 **7 Claims**

1. A method for manufacturing a fiber composite coupling element for interconnecting a driving member to a driven member, comprising the following steps: producing a central core of a low melting or dissolvable material, cutting sheets having predetermined sizes and configurations from preimpregnated fiber compound material having a given tackiness, forming layers of said sheets on said core by laminating said sheets onto said core with a predetermined fiber orientation in each layer relative to the next layer and in an overlapping relationship from sheet to sheet, said layers forming in combination a laminated assembly, incorporating connecting members (12) into the coupling element by contacting said connecting members with said sheets whereby the tackiness temporarily holds the connecting members in place, compressing the laminated assembly in a mold, curing the compressed assembly, whereby the curing bonds the sheets to one another and to said connecting members, removing the coupling element from the mold, and removing said central core from the finished coupling element without any additional machining.

4,372,796

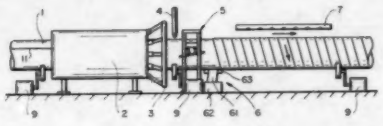
METHOD AND APPARATUS FOR WRAPPING A TAPE AROUND A PIPE

Walter J. Greuel, Jr., Pleasanton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 10, 1981, Ser. No. 291,689

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—187 **23 Claims**



1. A method of providing a substantially void-free tape wrapping around a longitudinally welded metal pipe having a longitudinal weld bead protruding from the surface thereof, which method comprises:

(1) simultaneously advancing the pipe at a constant rate in its axial direction and rotating the pipe at a constant rate about its axis;

(2) applying a viscous liquid sealing material to the outer surface of the pipe, as the pipe is advanced and rotated;

(3) passing the pipe, as it is advanced and rotated and after the sealing material has been applied to the surface thereof, past at least one doctor blade which doctors the sealing material to provide a smooth transition between the top of the weld bead and the adjacent outer surface of the pipe, the doctor blade being urged against the surface of the pipe so that it is resiliently deformed to conform generally to the shape of the pipe and to accommodate passage underneath it of the weld bead of the pipe, the doctor blade facing the advancing pipe surface, the mean angle of the axis of the doctor blade to the axis of the pipe, ϕ, being such that $1>\tan(\phi-5)>(d/c)$ where d is the axial distance which the pipe advances as it is rotated once, and c is the exterior circumference of the pipe and the angle between the surface of the doctor blade facing the advancing pipe surface and the surface of the pipe as it passes under the doctor blade, α, being from 20° to 80°; and

(4) wrapping a tape in a spiral overlapping manner around the pipe, as the pipe is adanced and retated and after it has passed the doctor blade.

4,372,797

METHOD FOR THE APPLICATION OF SUCTION TUBES TO PACKING CONTAINERS

Rolf M. Dilot, Lund, and Jan T. Hakansson, Eslöv, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 5,903, Jan. 28, 1979, Pat. No. 4,293,369. This application Jun. 2, 1981, Ser. No. 269,915

Int. Cl.³ B65B *19/34*

U.S. Cl. 156—249 **4 Claims**

1. A method for the application of suction tubes, wrapped in protective casings and arranged in the form of a continuous band, to packing containers, comprising:

conveying a plurality of packing containers toward a suction tube applicator station;

orienting the packing containers at an angle to a path of conveyance of the packing containers;

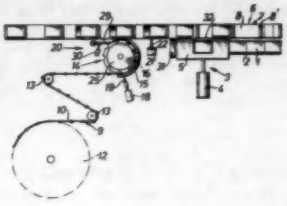
applying an adhesive to a wall of each of the packing containers;

conveying a plurality of suction tubes in the continuous band toward said suction tube applicator station;

separating individual suction tubes from the continuous band;

orienting said individual suction tubes with respect to the packing containers; and

attaching said individual suction tubes to the packing containers at said suction tube applicator station by contacting the protective casing of each of said individual suction tubes with said adhesive on said wall of a respective one of the packing containers.

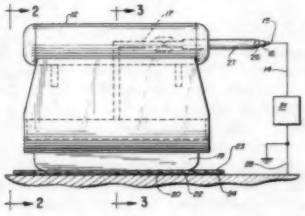


4,372,798

PROCESS FOR SECURING LAYERS OF MATERIAL TO SURFACES

Robert E. Dalton, 859 E. 169th St., South Holland, Ill. 60473

Continuation of Ser. No. 905,771, May 15, 1978, abandoned.
This application Mar. 10, 1980, Ser. No. 128,492
Int. Cl.³ B32B 31/24; H01G 00/00
U.S. Cl. 156—273.1 8 Claims



1. In the process for securing pressure-applied adhesive-coated film to a surface wherein an adhesive-coated film is positioned on a surface with the adhesive contacting the surface and pressure is applied to the film by a tool having an appendage for contacting the film while sliding thereon, the improvement which comprises simultaneously applying an electrostatic field across the film and adhesive from an electrode located in the tool through the tool appendage, which appendage is composed for a resistive semi-conductor, to the surface.

4,372,799

METHOD FOR USE IN THE MANUFACTURE OF A BUILDING ELEMENT

Lauritz B. L. Rasmussen, Lyngby, Denmark, assignor to Superfos Glasuld A/S (Superfos A/S), Vedbeak, Denmark

Filed Dec. 3, 1980, Ser. No. 212,512
Claims priority, application Denmark, Dec. 12, 1979, 5283/79
Int. Cl.³ C09J 5/02; B32B 31/04
U.S. Cl. 156—285 1 Claim

1. A method for manufacturing a building element in which a pair of opposed air impermeable cover boards forming opposite major surfaces of the element are separated by and secured to air impermeable edge strips constituting the side and end edges of the element, and a heat insulating material is positioned in the interior of the element, said method comprising the steps of;

forming an open casing by securing said edge strips to one of said cover boards;

applying moisture to the surface of said one cover board facing the interior of said casing and to one surface of the remaining cover board;

applying a moisture curing adhesive to cover substantially all of said moistened surfaces;

placing in said casing a substantially rigid, formstable core plate of an insulating material of a size and shape so as to occupy substantially all of the space within the casing, said core plate having an air permeable internal structure;

positioning said remaining cover board on said casing with its surface which previously had been moistened and had the adhesive applied thereto facing said core plate;

securing said remaining cover board to said edge strips;

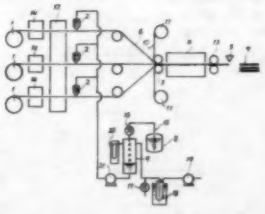
applying suction to the interior of the closed casing through an opening in the casing to produce a partial vacuum within the casing whereby to press said cover boards into firm contact with substantially all of both major surfaces of said core plate and cause said moisture to react with said adhesive so that the cover boards are inseparably bonded to said core member plate.

4,372,800

CONTINUOUS PROCESS FOR PRODUCING REINFORCED RESIN LAMINATES

Masayuki Oizumi; Masakazu Uekita, both of Kobe; Masana Goto, Miki; Ichiro Azumi, Ohtsu; Shoji Uozumi; Masaharu Abe, both of Kobe; Yasuo Fushiki, Takatsuki; Minoru Isshiki, Kobe, and Kunio Kawasaki, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 8, 1981, Ser. No. 223,402
Claims priority, application Japan, Jan. 8, 1980, 55-1020
Int. Cl.³ C09J 5/02
U.S. Cl. 156—307.3 4 Claims



1. In a continuous process for producing reinforced resin laminates comprising the steps of impregnating a cellulosic fibrous substrate with a liquid thermosetting unsaturated polyester resin which is free of volatile solvent and is capable of curing without generating liquid and gaseous by-products, laminating a plurality of the resin-impregnated substrates into a unitary member, sandwiching the laminate between a pair of covering sheets, and curing the laminate while supporting the same between said pair of covering sheets without applying any appreciable pressure, the improvement comprising:

(a) pre-impregnating said substrate with a pre-impregnating liquid comprising a mixture or condensate of:

(i) methylol melamine and/or methylol guanamine, and

(ii) a higher aliphatic derivative having at least one group capable of condensing with said methylol group; and

(b) adjusting the final resin content in said resin-impregnated

substrate at 10 to 90% by weight based upon the total weight of said resin-impregnated substrate.

4,372,801

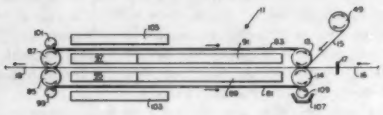
FILL STRAND TRANSFER APPARATUS FOR MAKING NON WOVEN FABRICS

Hollis H. Bascom, Livermore; Stephen Matweyou, Oakland; Alan J. Andersen, and John J. Greci, both of Livermore, all of Calif., assignors to Orcon Corporation, Union City, Calif.

Division of Ser. No. 103,621, Dec. 14, 1979, Pat. No. 4,295,905. This application Jun. 19, 1981, Ser. No. 275,494

Int. Cl.³ B32B *5/12*

U.S. Cl. 156—434 **4 Claims**



1. Apparatus for transferring fill strands to warp strands to form a fabric and comprising,

a set of pressure rolls,

warp guide means for guiding warp strands into the nip of the pressure rolls,

fill strand feed means for feeding a pre-formed planar set of adhesive coated fill strands having fixed orientation and spacing into the nip of the pressure rolls, and

wherein the adhesive on the fill strands is a composition which is heat activated under the pressure and/or heat produced in the pressure rolls to flow and to adhere to the warp strands to form the fabric.

4,372,802

APPARATUS FOR MOUNTING CHIP TYPE CIRCUIT ELEMENTS ON PRINTED CIRCUIT BOARDS

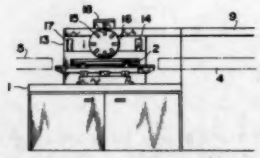
Kotaro Harigane; Kenichi Takahashi; Hirokazu Shudo, and Shuichi Tando, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Filed May 21, 1981, Ser. No. 266,109

Claims priority, application Japan, Jun. 2, 1980, 55-72753; Jun. 9, 1980, 55-79296; Nov. 17, 1980, 55-164509; Nov. 17, 1980, 55-164510; Nov. 19, 1980, 55-164813

Int. Cl.³ B32B *31/04*

U.S. Cl. 156—538 **11 Claims**



1. Apparatus for mounting chip type circuit elements on printed circuit boards, comprising:

supply unit means for supplying chip type circuit elements;

a plurality of pallets and means for conveying said pallets in an intermittent fashion in a particular direction;

sequence head means for shifting said chip type circuit elements from said supply unit means onto said pallets;

an X-Y table and means for conveying printed circuit boards onto said X-Y table;

mounting means including at least one mounting head for mounting said chip type circuit elements on a printed circuit board carried by said X-Y table; and

shifting head means for shifting said chip type circuit elements from said pallets to said at least one mounting head,

whereby upon said sequence head means shifting said circuit elements onto said pallets from said supply unit means, said pallets are conveyed in an intermittent fashion in said particular direction whereupon said shifting head means shifts said circuit elements to said mounting head from said pallets, and whereupon said mounting means mounts said circuit element on a printed circuit board carried by said X-Y table.

4,372,803

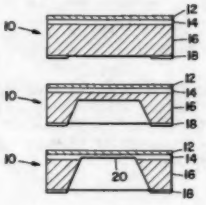
METHOD FOR ETCH THINNING SILICON DEVICES

Joseph R. Gigante, Oceanside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1980, Ser. No. 191,658

Int. Cl.³ H01L *21/308*

U.S. Cl. 156—626 **5 Claims**



1. The method of etch-thinning silicon devices in three sequential etches such that a uniform approximately 10 micron thick membrane is formed over the pixels of the device comprising the steps in combination:

(a) providing a multi-layer wafer, said wafer having a first layer transparent to light and impervious to etching fluids, an epitaxial second layer having one surface adhesively bonded to one side of said first layer, and a p^+ third layer formed on the opposite surface of said epitaxial layer, said third layer having a higher boron doping level than said second layer such that there exists a transition region between said third layer and said second layer having a predetermined doping gradient;

(b) forming an etch mask on the opposite surface of said third layer;

(c) applying a first fluid etchant in concert with ultrasonic agitation to regions of said third layer where exposed by said etch mask said first fluid etchant consisting of, by weight, 2 parts KOH to 3 parts H_2O at 60° C. and acting to pre-thin said third layer;

(d) shining a light through said first layer and into said wafer while said first fluid etchant is applied until said exposed regions become translucent;

(e) subdividing said wafer into smaller components;

(f) applying a second fluid etchant in an agitation washtub to said components having exposed regions etched by said first fluid etchant, said second fluid etchant consisting of 1 part HF to 3 parts HNO_3 to 10 parts acetic acid in concert with a critical volumetric amount of H_2O_2 such that said exposed region of said third layer and a portion of said transition region lying thereunder is etched away, said critical amount of H_2O_2 having a critical ratio to said second fluid etchant dependent on the area exposed to said second fluid etchant, said proportion being 2:350 for a ¼ square inch area and 5:350 for areas up to 3 square inches;

(g) removing said components when said exposed areas appear flat and reflecting; and

(h) applying a third fluid etchant to said exposed areas of said components to clean them, said third fluid etchant

consisting of, by proportion, 1.0 gram potassium permanganate to 150 ml HF to 150 ml acetic acid.

4,372,804

METHOD FOR MAKING MULTILAYER PRINTED WIRING BOARD

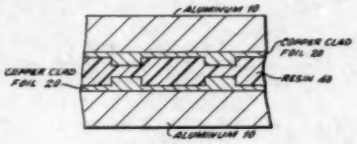
Takayoshi Hanabusa; Kenji Yamamoto, both of Nagano; Shinzi Umemoto, Suzaka; Keiji Kurosawa, and Mitsuo Yamashita, both of Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 64,122, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 820,565, Aug. 1, 1977, abandoned. This application Apr. 2, 1981, Ser. No. 250,177

Claims priority, application Japan, Aug. 4, 1976, 51-92360

Int. Cl.[3] **B44C** *1/22*; **C03C** *15/00, 25/06*; **C23F** *1/02*

U.S. Cl. 156—631 **8 Claims**



1. A method of making a multilayer printed wiring board including a plurality of printed wiring boards, said method comprising the steps of

providing a copper clad laminate with buried lands on a basic material consisting of glass fiber impregnated with resin and arranging copper foil with lands projecting in correspondence with land forming positions at a first side and a flat surface second side so that the projecting lands face the basic material side;

laminating copper foil and said basic material to provide a copper clad laminate;

etching said copper clad laminate to provide an intermediate layer substrate having a desired circuit including a land pattern and circuit conductors;

laminating a plurality of said intermediate layer substrates by thermal bonding with said basic material and applying pressure to the layers to provide a multilayer laminate;

boring through holes to specified lands of each layer of said multilayer laminate; and

plating the through holes bored in said multilayer laminate upon completion of said boring.

4,372,805

METHOD FOR REGENERATING AN ETCH SOLUTION FOR ALUMINUM AND THE ALLOYS THEREOF

Masaaki Takahashi, c/o Toyo Giken Kogyo Co., Ltd., 19-17, Kaminarimon 2-chome, Taito-ku, Tokyo, and Hideki Hamamura, 7-9, Kishibeminami 2-chome, Suita, Osaka, both of Japan

Filed Dec. 28, 1981, Ser. No. 334,467

Claims priority, application Japan, Aug. 10, 1981, 56-125499

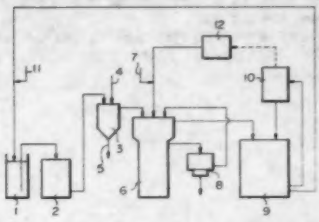
Int. Cl.[3] **C23F** *1/00*; **B44C** *1/22*; **C03C** *15/00, 25/06*

U.S. Cl. 156—642 **4 Claims**

1. A method for regenerating an etch solution for aluminum and the alloys thereof comprising the steps of:

(a) diluting at least a portion of an etch solution, after being used in caustic etching of aluminum and the alloys thereof, containing 100 through 240 g/l of free sodium hydroxide and 30 through 200 g/l of dissolved aluminum which is in an unsaturated state, as aluminum hydroxide, or in a similar condition by adding water in an amount of 0.5 through 2.5 times by volume based on the volume of the etch solution to be diluted, whereby the solution containing aluminum hydroxide at a supesaturated state is formed;

(b) concentrating the resultant liquid to such an extent that the concentration of free sodium hydroxide is within the



range of from 110 to 300 g/l, whereby the concentrated solution is reused as an etch solution.

4,372,806

PLASMA ETCHING TECHNIQUE

John L. Vossen, Jr., Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,851

Int. Cl.[3] **C23F** *1/02*

U.S. Cl. 156—643 **4 Claims**

1. In a process of plasma etching a metal or an alloy thereof which, in the presence of moisture, will form a passivating oxide at room temperature under plasma discharge, the improvement comprising pretreating said metal or alloy with a hydrogen glow discharge.

4,372,807

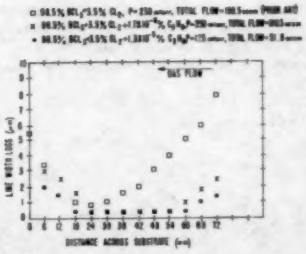
PLASMA ETCHING OF ALUMINUM

John L. Vossen, Jr., Bridgewater, N.J., and Bernard Halon, Brooklyn, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1982, Ser. No. 362,041

Int. Cl.[3] **C23F** *1/02*

U.S. Cl. 156—643 **7 Claims**

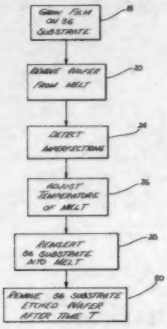


1. In a process of plasma etching aluminum or an alloy thereof with an etchant gas which will isotropically etch the sidewalls of patterns being etched, the improvement comprising adding to the etchant gas gaseous hydrocarbon which will polymerize under conditions of glow discharge in an amount effective to reduce sidewall etching.

4,372,808
PROCESS FOR REMOVING A LIQUID PHASE EPITAXIAL LAYER FROM A WAFER

Baylor B. Triplett, La Honda; Carlo Ferrando, Aptos, and Guido Galli, Saratoga, all of Calif., assignors to Intel Magnetics, Inc., Santa Clara, Calif.

Filed Mar. 22, 1982, Ser. No. 360,809
Int. Cl.³ H01L 21/312; B44C 1/22
U.S. Cl. 156—655 9 Claims


Grow Film on the Substrate
Remove Wafer From Melt
Detect Imperfections
Adjust Temperature of Melt
Reinsert the Substrate into Melt
Remove the Substrate Etched Wafer After Time T

1. A process for etching an epitaxial layer of material from a substrate comprising the steps of:

providing a liquid melt including a predetermined quantity of said epitaxial material within said melt;

adjusting the temperature of said melt within a predetermined range such that said melt temperature lies above an equilibrium temperature of said epitaxial layer, and below an equilibrium temperature of said substrate, such that said epitaxial layer will be etched off of said substrate at a known rate, said rate being a function of said temperature;

immersing said substrate including said epitaxial layer into said melt;

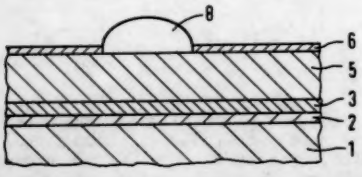
removing said substrate from said melt once a desired amount of epitaxial material has been etched off of said substrate;

whereby said epitaxial material is removed from said substrate.

4,372,809
METHOD FOR MANUFACTURING SOLDERABLE, TEMPERABLE, THIN FILM TRACKS WHICH DO NOT CONTAIN PRECIOUS METAL

Virinder Grewal, Ebersberg, and Werner Reindl, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,100
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107943
Int. Cl.³ C23F 1/02; B05D 5/12
U.S. Cl. 156—656 8 Claims



1. A method for manufacturing solderable and temperable thin film conductor tracks with no precious metal on an electrically non-conducting substrate comprising the steps of:

applying a resistance layer to said substrate;

applying an adhesive layer over said resistance layer;

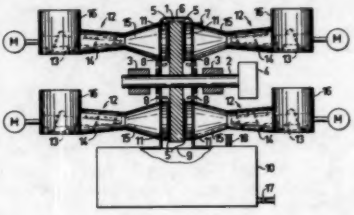
applying a conductive layer consisting of copper over said adhesive layer; and

applying an anti-oxidation and anti-corrosion layer consisting of aluminum or an aluminum alloy in vacuum to said adhesive layer and to said conductive layer.

4,372,810
METHOD AND DEVICE FOR MANUFACTURING MECHANICAL PULP

Hjalmar S. I. Bystedt, Enebyberg, Sweden, assignor to Sunds Defibrator AB, Stockholm, Sweden

Filed Oct. 9, 1980, Ser. No. 195,707
Int. Cl.³ D21B 1/04
U.S. Cl. 162—23 8 Claims



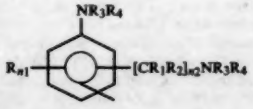
1. Method for manufacturing mechanical pulp from lignocellulosic material by forcing the said material into contact with opposite end faces of a single grinding disc (1) which revolves about a central axle (2) perpendicular to said two opposite end faces of the disc, which method is characterized in that the material is separately fed in bulk, particulate form to each face, a large number of particles of the said material simultaneously being retained against, compressed and, in the presence of water, forced directly into contact with one or more grinding areas (5) located on each of said opposite end faces of said single grinding disc, the disc being enclosed in a sealed, pressurized housing (6).

4,372,811
ALKALINE OXYGEN DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP IN THE PRESENCE OF AROMATIC DIAMINES

Hans O. Samnelson, and Kjell E. Abrahamsson, both of Gothenburg, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed May 4, 1981, Ser. No. 260,436
Claims priority, application Sweden, Mar. 21, 1981, 8003407
Int. Cl.³ D21C 3/02, 3/04
U.S. Cl. 162—38 31 Claims

1. A process for the alkaline oxygen delignification and bleaching of chemical cellulose pulp while inhibiting degradation of carbohydrates in the cellulose pulp, which comprises alkaline oxygen delignifying and bleaching chemical cellulose pulp in the presence of an aromatic diamine having at least one amino group directly attached to an aromatic ring and having the formula:



in which:

R is selected from the group consisting of hydrogen, alkyl, aryl and alkylaryl (the aryl including aryl condensed with the

ring), cycloalkyl and alkyl cycloalkyl (the cycloalkyl including cycloalkyl condensed with the

ring), the alkyl having from one to six carbon atoms, the aryl having from six to eighteen carbon atoms, the cycloalkyl having from five to seven carbon atoms; hydroxyl and carboxylic acid;

R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, aryl having from six to ten carbon atoms, and cycloalkyl having from five to eight carbon atoms;

n_1 is a number from one to four; and

n_2 is a number from zero to six, the aromatic diamine being in an amount sufficient to inhibit degradation of carbohydrates in the cellulose pulp during said delignifying and bleaching, said alkaline oxygen delignifying and bleaching being with oxygen and alkaline chemical in an aqueous liquid phase under superatmospheric pressure at an elevated temperature of at least 80° C.

4,372,812

CHLORINE FREE PROCESS FOR BLEACHING LIGNOCELLULOSIC PULP

Richard B. Phillips, Mobile, Ala.; Arthur W. Kempf, Warwick, N.Y., and Robert C. Eckert, Kent, Wash., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 57,170, Jun. 22, 1979, abandoned, which is a continuation of Ser. No. 894,606, Apr. 7, 1978, abandoned. This application Feb. 11, 1981, Ser. No. 233,668

Int. Cl.³ D21C *9/10, 9/16*

U.S. Cl. 162—40 **6 Claims**

1. A non-chlorine multi-stage process for bleaching chemical lignocellulosic pulp which minimizes changes in temperature and pH from stage to stage, said process comprising in sequence:

(a) an oxygen bleaching stage carried out at about 3% to 30% pulp consistency, at 80° to 120° C. and at a pH of 9 to 12 for a reaction time of 10 to 60 minutes with an oxygen treatment solution comprising 0.2% to about 3% oxygen, based on oven-dried pulp, followed in sequence by separating the oxygen treatment solution from and washing the pulp at about 1% pulp consistency to afford final removal of the oxygen treatment solution from the pulp; then

(b) a peroxide bleaching stage carried out at 10% to 25% pulp consistency, at 20° to 90° C. and at a pH of 3 to 5 for a reaction time of 10 to 300 minutes, with a peroxide treatment solution comprising 0.2% to about 2% peroxide, based on oven-dried pulp, followed in sequence by separating the peroxide treatment solution from and washing the pulp at about 1% pulp consistency to afford final removal of the peroxide treatment solution from the pulp, said peroxide being selected from the group consisting of alkaline hydrogen peroxide, acid hydrogen peroxide, and peracid; and then

(c) at least one ozone bleaching stage carried out at 1% to 40% pulp consistency, at 15° to 60° C. and at a pH of 2 to 7, with an ozone treatment solution until 0.2% to 1% ozone on an oven-dried pulp basis is consumed, each said ozone bleaching stage being followed by separating the ozone treatment solution from and washing the pulp at about 1% pulp consistency to afford final removal of the ozone treatment solution from the pulp.

4,372,813

PROCESS FOR INHIBITING THE CORROSION OF EQUIPMENT MADE OF TITANIUM

Lucien Clerbois, and Lucien Plumet, both of Vilvoorde, Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Feb. 20, 1981, Ser. No. 236,822

Claims priority, application France, Feb. 21, 1980, 80 03890

Int. Cl.³ D21C *7/00;* **C11D** *7/54;* **C23F** *11/18*

U.S. Cl. 162—48 **10 Claims**

1. Process for inhibiting the corrosion of equipment made of titanium or of alloys containing titanium by an aqueous solution containing a peroxy compound, comprising inhibiting the corrosion by having the solution contain calcium, strontium or barium ions.

4,372,814

PAPER HAVING MINERAL FILLER FOR USE IN THE PRODUCTION OF GYPSUM WALLBOARD

Norman E. Johnstone, and John R. Kehoe, both of Schaumburg, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed May 13, 1981, Ser. No. 263,371

Int. Cl.³ B32B *13/08*

U.S. Cl. 162—124 **22 Claims**

1. Gypsum wallboard comprising a core of set calcium sulfate dihydrate and a paper cover sheet bonded to each surface thereof, each of said paper cover sheets comprising a composite paper which comprises in dry weight percent:

(A) fibers in an amount of from about 65% to about 90% and having a fiber freeness of from about 350 to 550 ml. Canadian Standard Freeness,

(B) a particulate mineral filler in an amount of from about 10% to about 35%,

(C) a binder in an effective amount to retain said mineral filler,

(D) a flocculant in an amount of from about 2 lb. to about 4 lb./ton, and

(E) a sizing agent in an effective amount to prevent water penetration,

said paper being sufficiently porous to permit good drainage and rapid drying during its production, and when applied to the surfaces of a gypsum slurry for forming wallboard, permits less heat to be utilized in the wallboard conversion, the use of said paper thereby conserving energy both in paper production and in the board production.

4,372,815

METHOD FOR UPGRADING PAPER AND THE PRODUCT FORMED THEREBY

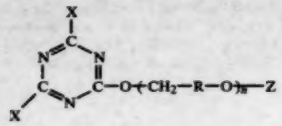
David D. Newkirk, Beaverton, Oreg., and Darrel L. Wilhelt, Wadsworth, Ill., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Aug. 17, 1981, Ser. No. 293,075

Int. Cl.³ D21H *3/02*

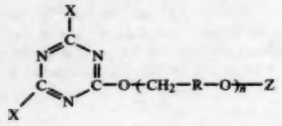
U.S. Cl. 162—158 **8 Claims**

1. A method for upgrading cellulose sheets by substantially increasing the absorbency, bulk, and softness thereof, which comprises treating cellulose with a chemical compound having the following general formula:



in which X represents halogen; R represents an alkylene group, either straight chain or branched, having from one to five carbon atoms; n is from about 2 up to about 30; and Z is a halogen substituted 1,3,5-triazinyl group.

5. An absorbent, bulky, and soft cellulose sheet which comprises cellulose which has been treated with a chemical compound having the following general formula:



in which X represents halogen; R represents an alkylene group, either straight chain or branched, having from one to five carbon atoms; n is from about 2 up to about 30; and Z is a halogen substituted 1,3,5-triazinyl group.

4,372,816

HEAD BOX FOR A PAPER MAKING MACHINE

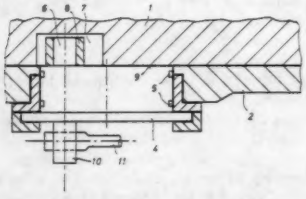
Jakob Wolf, Heidenheim, and Simon Juhas, Nattheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,724

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010730

Int. Cl.³ D21F 1/06

U.S. Cl. 162—343 **14 Claims**



1. In head box for a paper making machine, the head box having a head box chamber and the chamber being defined between opposed side walls of the head box; a circular opening in one said side wall; the chamber including an outlet channel;

at least one partition wall supported in the outlet channel of the chamber between the side walls;

and adjusting means for adjusting the initial position of the at least one partition wall in the outlet channel; the adjusting means comprising a circular shaft supported in a watertight manner in the circular opening formed in the one side wall of the chamber and being rotatable about its axis with respect to the side walls;

the shaft having a side facing inwardly of the chamber; a journal pin being supported on the side of the shaft facing inwardly of the chamber and being eccentric with respect thereto; means in the partition wall for receiving the journal pin for adjusting the initial position of the partition wall as the shaft is rotated.

4,372,817

NUCLEAR FUEL ELEMENT

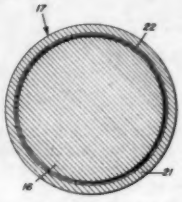
Joseph S. Armijo, Saratoga, Calif., and Louis F. Coffin, Jr., Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 727,183, Sep. 27, 1976, abandoned. This application Feb. 23, 1979, Ser. No. 14,348

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ G21C 3/20

U.S. Cl. 376—417 **4 Claims**



1. A nuclear fuel element which comprises an elongated composite cladding container having a zirconium alloy tube containing constituents other than zirconium in an amount greater than 1000 parts per million and a continuous barrier of zirconium metal of impurity content less than about 500 parts per million of which impurity content the oxygen content is less than about 200 parts per million, said barrier being metallurgically bonded to the inside surface of the alloy tube, said high purity zirconium metal barrier being of thickness from about 1 percent to 30 percent of the thickness of said alloy tube, a central core of a body of nuclear fuel material selected from the group consisting of compounds of uranium, plutonium, thorium and mixtures thereof disposed in and partially filling said container so as to leave a gap between said container and said core and an internal cavity at one end of the container, an enclosure integrally secured and sealed at each end of said container and a nuclear fuel material retaining means positioned in the cavity.

4,372,818

APPARATUS FOR THE DISTILLATION AND RECTIFICATION OF MIXTURES

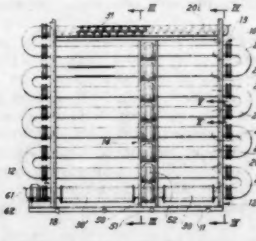
Yaacov Kaganovsy, Ramat-Gan; Yosef Kustanovich, Rechovot; Shimshon Shmuter; Vadim Gelfer, both of Ramat-Gan, and Shimon Muchnik, Tel-Aviv, all of Israel, assignors to Hydrola Ltd., Bat-Yam, Israel

Continuation of Ser. No. 915,182, Jun. 14, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,636

Claims priority, application Israel, Jun. 14, 1977, 52316

Int. Cl.³ B01D 3/28, 3/30

U.S. Cl. 202—83 **17 Claims**



1. An apparatus for processing by fractional distillation or

rectification a volatile fluid material including a mixture of plural components having different boiling points, said apparatus comprising:

a plurality of substantially horizontally aligned tubular main sections extending parallel to each other and successively positioned one above the other;

a plurality of tubular connecting sections joining adjacent ends of adjacent of said main sections, such that at least a number of said sections are connected in series to define an internal space providing an elongated and tortuous path for the flow therethrough of materials to be processed;

means for introducing volatile fluid material at at least one point into said internal space;

means for applying heat to at least one of said main sections and thereby for achieving vaporization of at least some of the plural components of said volatile fluid material within said internal space, and means for withdrawing heat from at least another one of said main sections and thereby for condensing at least some of the vapors in said internal space, whereby there are provided throughout said internal space vapor portions and liquid portions in contact;

stirring means for agitating and mixing said liquid and vapor portions flowing through at least some of said sections; and

means for withdrawing separate and different said portions from at least two separate locations of said internal space, said at least two separate locations being distinct from one another and from said point at which said volatile fluid material is introduced into said interval space.

4,372,819

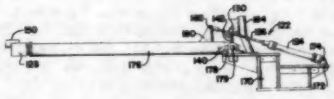
ALIGNING DEVICE

Rodney C. Irwin, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 298,788, Sep. 2, 1981, Pat. No. 4,336,107. This application Mar. 22, 1982, Ser. No. 360,601

Int. Cl.³ B61L *15/00, 25/02;* **C10B** *33/00, 41/00*

U.S. Cl. 202—239 **18 Claims**



1. A device for aligning rail mounted equipment with a track-side structure comprising:

(a) a base structure having vertically projecting forward and rearward base brackets;

(b) an arm pivotably connected at its rearward end to the forward base bracket so as to be rotatable thereon about a horizontal first axis in a vertical arc from an elevated to a lowered position, and said arm, itself, having adjacent its rearward end a vertical arm bracket and at its terminal end an aligning projection which is engageable with an aligning plate when the arm is displaced to its lowered position;

(c) a piston and cylinder combination pivotally connected at its rearward end to the rearward base bracket so as to be rotatable thereon through a vertical arc about a horizontal second axis, said second axis being parallel to the first axis;

(d) a rod projecting forward from the piston of said piston and cylinder combination toward the arm bracket and connected to said arm bracket so as to pivot on a third axis, said third axis being parallel to said first axis;

(e) means for compressing said piston and cylinder combination so as to displace the arm to its elevated position;

(f) means for expanding said piston and cylinder combination so as to displace the arm to its lowered position; and

(g) control means for selectively activating either said means for expanding the piston and cylinder combination or said means for compressing said piston and cylinder combination.

4,372,820

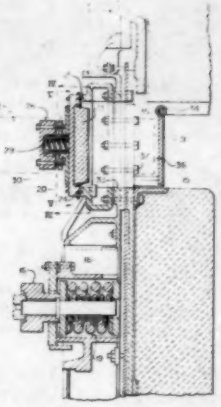
CHUCK DOOR FOR COKE OVEN PUSHER SIDE DOOR AND HEAT RADIATION SHIELD

Roy Naevestad, Fanwood, N.J., assignor to Wilputte Corporation, Murray Hill, N.J.

Filed Feb. 17, 1981, Ser. No. 234,965

Int. Cl.³ C10B *25/06*

U.S. Cl. 202—248 **2 Claims**



1. In a coke oven having a coking chamber, a doorway into said coking chamber and a main door to close said doorway, said main door having an auxiliary opening therein through which to insert a leveling bar for leveling coal in said coking chamber, and an auxiliary door hinged to swing outwardly on said main door for closing said auxiliary opening therein, the improvement comprising a heat shield interposed between said auxiliary door and said coking chamber, and means affixed to said main door pivotally suspending on a horizontal hinge said heat shield inside said auxiliary opening within said main door for movement independent of the auxiliary door, whereby when said main door is closed said heat shield swings upwardly and inwardly responsive to contact of the end of the leveling bar therewith as it is moved into the coking chamber and whereby said heat shield swings down automatically upon withdrawal of said leveling bar.

4,372,821

EMISSION CONTROL APPARATUS

Thomas V. Reinauer, Summit, N.J., assignor to United States Filter Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,981

Int. Cl.³ C10B *33/00, 45/00*

U.S. Cl. 202—263 **9 Claims**

1. Apparatus for controlling the gaseous and particulate emissions from a battery of coke ovens occasioned by the discharge of coke from the individual ovens constituting the same comprising

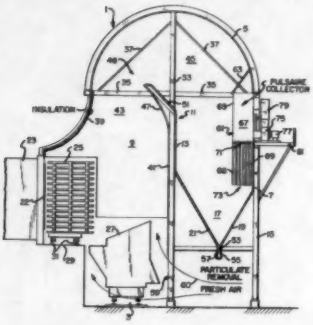
a shed extending along the coke delivery side of said battery of coke ovens having a roof of progressively increasing elevation adjacent the coke delivery side of said ovens, spaced external end walls and an external outer wall,

a longitudinal upright partition within said shed disposed intermediate said outer wall and the delivery side of said battery of coke ovens and dividing said shed into an elongate emission entrapment chamber for containing the gaseous and particulate emissions attendant coke dis-

charge and an expansion chamber extending parallel to and offset laterally from the entrapment chamber,

flow restriction means disposed at the upper end of said elongate emission entrapment chamber for accelerating the velocity of the gaseous emission attendant coke discharge leaving said entrapment chamber so that particulate matter is inhibited from settling in said entrapment chamber and is carried into said expansion chamber where gas velocity is reduced and gravity induced separation of entrained particulates is effected,

said expansion chamber dependently terminating in a sloped wall hopper means for collection separated particulate matter,



means for venting said expansion chamber and for separating nonsettled particulates from said emitted gaseous carrier consisting essentially of filter means and fan means,

said filter means employing fabric filter media and having a plurality of outlets disposed within said expansion chamber and mounted adjacent an external shed wall,

said fan means connected to said filter means for inducing a directed flow of said emitted gaseous carrier from said expansion chamber, through said fabric filter medium and externally of said shed and with an attendant accumulation of emitted particulate matter on the upstream side of said fabric filter medium,

and means for effecting the periodic removal of said accumulated particulate matter from said fabric filter medium and introduction thereof into said hopper means.

4,372,822

PRODUCTION OF ANHYDROUS ETHANOL

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers & Chemical Corp.

Continuation of Ser. No. 156,979, Jun. 6, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 287,018

Int. Cl.³ B01D *3/36*

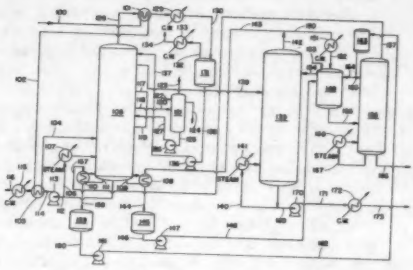
U.S. Cl. 203—19 **9 Claims**

1. A process for obtaining substantially anhydrous ethanol which comprises:

(a) concentrating to high proof a dilute aqueous ethanol feed containing one or more dissolved components in an amount which would, unless removed therefrom, tend to interfere with phase separation in a decanter, to provide an overhead vapor stream containing a major proportion of the low boiling component(s) present in the feed, and a pasteurized cut of concentrated ethanol containing the balance of the low boiling component(s) present in the feed of sufficient value to eliminate the requirement of a preliminary extractive distillation step;

(b) dehydrating the aforesaid pasteurized cut to substantially complete dryness in an anhydrous column operated under substantially elevated pressure with thermal values recovered therefrom being used in the operation of the rectifying column;

(c) separating condensed overhead vapors from the anhydrous column in a decanter into an azeotrope-rich phase and a water-rich phase containing ethanol and substantially all of said balance of said low boiling component(s); and,



(d) separating the water-rich phase obtained from the decanter into vapor overheads containing ethanol and low boiling component(s), and water, in a light-ends column operated under substantially elevated pressure with thermal values recovered therefrom being used in the operation of the rectifying column.

4,372,823

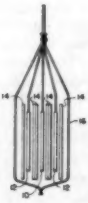
RECHARGEABLE ELECTRICAL STORAGE BATTERY WITH ZINC ANODE AND AQUEOUS ALKALINE ELECTROLYTE

Peter K. Church, Cascade, and Alan G. Phillips, Arvada, both of Colo., assignors to El-Chem Corporation, Cascade, Colo.

Division of Ser. No. 100,845, Dec. 6, 1979, Pat. No. 4,307,164, which is a division of Ser. No. 927,927, Jul. 25, 1978, Pat. No. 4,207,391. This application Oct. 16, 1981, Ser. No. 312,098

Int. Cl.³ H01M *10/44*

U.S. Cl. 204—2.1 **12 Claims**



1. A method of making an anode for a battery having a zinc containing anode which comprises forming a slurry of finely divided zinc metal particles, applying a coating of the slurry to a metal substrate, drying the slurry, immersing the coated substrate in an aqueous alkaline electrolyte solution, positioning a cathode in the electrolyte, electrically connecting the anode with the cathode until the cathode is substantially completely discharged as evidenced by the evolution of hydrogen gas therefrom and maintaining the electrical connection for a period of time sufficient to oxidize in situ substantially all of the zinc metal in the coating to zinc oxide as evidenced by substantial cessation of hydrogen evolution at the cathode.

4,372,824

METHOD OF MANUFACTURING OXYGEN SENSOR

Nobuhiro Toda, Aichi, and Masahiko Yamada, Nagoya, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 16, 1981, Ser. No. 243,803
Claims priority, application Japan, Apr. 15, 1980, 55-50082
Int. Cl.³ C25D 5/10, 5/34, 5/50, 7/04
U.S. Cl. 204—25 9 Claims

1. In a method of manufacturing an oxygen senser having an oxygen ion transmissible solid electrolyte, an inside electrode adhered to an inner surface of said electrolyte, and an outside electrode adhered to an outside surface of said electrolyte, said senser being operative to produce between said inside and outside electrodes an electromotive force corresponding to the difference between an oxygen concentration at the outer surface exposed to a detection gas and an oxygen concentration at the inner surface exposed to a reference gas, the improvement comprising the successive steps of adhering to the outer surface of said solid electrolyte an outside electrode having a thickness of at least 0.5μ by thin film techniques, heat treating said outside electrode at a temperature higher than the temperature at which a metal constituting the main ingredient of said outside electrode begins to be sintered to provide on said outside electrode a number of holes or broken holes whose diameter or width is larger than the thickness of said outside electrode, adhering to the inner surface of said solid electrolyte a porous inside electrode by thin film techniques or a suspension coating process, and heat treating said inside electrode at a temperature lower than the temperature at which a metal constituting said inside electrode begins to be sintered.

4,372,825

PLATING SPARGER AND METHOD

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Nov. 6, 1981, Ser. No. 318,953
Int. Cl.³ C25D 5/08, 21/10
U.S. Cl. 204—27 9 Claims

1. A sparger assembly for use in a plating chamber filled with an electrolyte comprising, in combination,

a plurality of vertical sparger pipes,

a plurality of nozzles positioned extending diametrically from each of said pipes,

said pipes being oriented within the plating chamber with the nozzles directed at an angle with the cathode,

alternating sparger pipes and nozzles being spaced with axes of flow intermediate the axis of flow of each adjacent sparger pipe, whereby a plurality of footprint elliptical-type patterns are directed against a workpiece passing by each sparger nozzle.

4,372,826

ELECTROLYTE FOR CATHODIC DEPOSITION OF NICKEL ALLOYS WITH IRON

Vaclav Landa; Jaromir Vitek; Pavel Nejedly; Vladimir Holpuch, all of Prague, Czechoslovakia; Juozas Bubelis, and Atanas-Nemezyus Stepanovicius, both of Vilnius, U.S.S.R., assignors to Statni vyzkumny ustav materialu, Prague, Czechoslovakia

Filed May 6, 1981, Ser. No. 260,936
Claims priority, application Czechoslovakia, Mar. 7, 1980, PV 1609
Int. Cl.³ C25D 3/56
U.S. Cl. 204—43 T 7 Claims

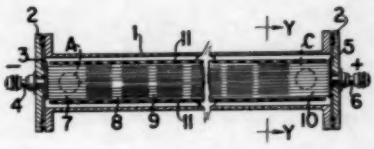
1. An electrolyte for the cathodic deposition of nickel alloys with iron, comprising an aqueous solution of nickel/II/ sulphosalicylate in a concentration from 0.1 to 1.05×10^3 mole.m^{-3} and iron/II/ sulphosalicylate, in a concentration from 0.01 to 0.30×10^3 mole.m^{-3}.

4,372,827

NOVEL HORIZONTAL DIAPHRAGMLESS ELECTROLYZER

Placido M. Spaziante, Lugano, Switzerland, and Giancarlo Sioli, Cernobbio, Italy, assignors to Pancior S.A., Taverne, Switzerland

Filed Nov. 10, 1980, Ser. No. 205,246
Int. Cl.³ C25B 1/26, 9/00
U.S. Cl. 204—95 20 Claims



1. A horizontal diaphragmless bipolar electrolyzer comprising a horizontal housing made of electrically insulating material, an anodic or cathodic plate at one end of the housing provided with a plurality of blade shaped electrodes vertically arranged along the housing axis, a reverse polarity plate at the opposite end of the housing provided with a plurality of blade shaped electrodes vertically arranged along the housing axis, at least one bipolar electrode element with blade shaped anodes and cathodes vertically arranged on opposite sides thereof on the housing axis to interleaf with adjacent electrodes of opposite polarity whereby there is unrestricted horizontal electrolyte flow from end plate to end plate, means for introducing fresh electrolyte at one end of the housing, means for removing treated electrolyte at the opposite end, a space above the electrode assembly for gas disengagement and removal, a space below the electrode assembly for solid particles collection and means for impressing an electrolysis current thereon.

4,372,828

PROCESS FOR PREPARING ARSENIC ACID

Byung K. Ahn, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,919
Int. Cl.³ C25B 1/22
U.S. Cl. 204—103 9 Claims

1. A process for the oxidation of As_2O_3 to H_3AsO_4 in an electrolysis cell which comprises, periodically reducing the anode operating potential, in an amount and for a time sufficient to reactivate the anode so as to increase the current density in the cell.

4,372,829

METHOD AND APPARATUS FOR REMOVING METAL FROM A METAL-LADEN SOLUTION

Johnny C. Cox, Rte. 1, Box 227E, Oliver Springs, Tenn.

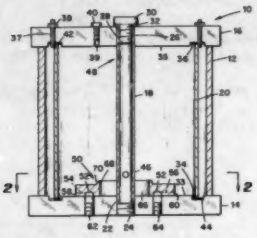
Filed Mar. 23, 1981, Ser. No. 246,330
Int. Cl.³ C25C 1/22, 7/00
U.S. Cl. 204—109 7 Claims

1. A method for recovery of metallic silver from a solution containing silver ions employing an electrolytic cell that includes a hollow anode disposed concentrically within a hollow cylindrical cathode comprising the steps of:

applying an electrolysis current to said anode and cathode,

directing streams of said solution from outlets of a manifold located in the bottom region of said electrolytic cell, said outlets being radially spaced outwardly from said anode,

toward said cylindrical cathode and at an acute angle to the radius of said cylindrical cathode to develop a vortex carrying solution helically upwardly along said cathode for processing contact with said cathode; and



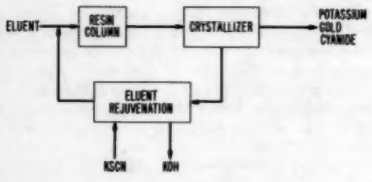
withdrawing a portion of said processed solution from the bottom region of said electrolytic cell through apertures located radially inwardly from said manifold outlets.

4,372,830

RECOVERY OF GOLD IN GOLD PLATING PROCESSES

Henry H. Law, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 18, 1982, Ser. No. 359,285
Int. Cl.³ C25R *1/20*
U.S. Cl. 204—110 15 Claims



1. A process involving the use of gold in the form of gold cyanide ion dissolved in aqueous solution where gold cyanide ion is recovered from at least a portion of the aqueous solution by absorption on an anion-exchange resin and the gold is removed from the resin using an eluent characterized in that the eluent comprises at least 0.1 molar thiocyanate ion, 5–95 weight percent organic solvent and water and the organic solvent consists essentially of at least one organic compound selected from the group consisting of formamide, dimethylformamide, dimethylsulfoxide, dimethylacetamide, N-methyl-2-pyrrolidone, acetonitrile, acetone, tetrahydrofuran, diethylacetamide, diethylformamide, triethylphosphate, trimethylphosphate, tributylphosphate, dimethoxyethane, ethylamine, ethylenediamine, triethylamine, propylene carbonate, dioxane, pyridine and dioxolane.

4,372,831

ELECTROLYTE SOLUTION FOR ELECTROPOLISHING

Helmut Rosswag, Aalen, Fed. Rep. of Germany, assignor to Schenk-Filterbau Gesellschaft mit beschränkter Haftung, Waldstetten, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,635
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949807
Int. Cl.³ C25F *3/24*
U.S. Cl. 204—129.8 7 Claims

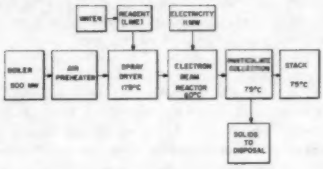
6. An electrolyte solution for electropolishing metallic workpieces, said solution comprising:
a base electrolyte of concentrated mineral acid; and
at least one additive, in the form of a polyphosphate, added to said base electrolyte to prevent etching of the metal surface of the workpiece which is to be polished, said mineral acid for said base electrolyte being selected from the group consisting of phosphoric acid, sulfuric acid, nitric acid, perchloric acid, and mixtures thereof, and 800 ml/l of approximately 85% technical grade phosphoric acid, 100 ml/l of approximately 96% sulfuric acid, 100 ml/l water, 2.5 to 3 mg/l wetting agent, and 4 to 5 g/l polyphosphate.

4,372,832

POLLUTION CONTROL BY SPRAY DRYER AND ELECTRON BEAM TREATMENT

John R. Bush, Naperville, Ill., assignor to Research-Cottrell, Incorporated, Bridgewater Township, Somerset County, N.J.

Filed Jan. 21, 1981, Ser. No. 226,853
Int. Cl.³ B01J *19/08*
U.S. Cl. 204—157.1 R 11 Claims



1. A process for removing pollutants including at least sulfur oxides and/or nitrogen oxides from effluent gas, the steps comprising;
(a) delivering the effluent gas into a spray dryer,
(b) injecting liquid and a reagent into the effluent gas in the spray dryer, thereby decreasing its temperature, and increasing its moisture content, and the reagent reacting with sulfur oxides in the effluent gas to form a reaction product, said reagent being injected only into effluent gas in the spray dryer;
(c) conveying the decreased temperature, increased moisture content, effluent gas including the reaction product and unreacted reagent into an irradiation chamber,
(d) irradiating the decreased temperature, increased moisture content, effluent gas in the irradiation chamber, thereby converting gaseous sulfur oxides and/or nitrogen oxides into mist and/or solid particles,
(e) subjecting the irradiated effluent gas to dry particulate collection, and wherein said reagent is a member of the group consisting essentially of:
lime,
limestone,
sodium compounds,
magnesium compounds,
or mixtures thereof.

4,372,833

PHOTOGENERATION OF ACTIVE FORMATE DECOMPOSITION CATALYSTS TO PRODUCE HYDROGEN FROM FORMATE AND WATER

Allen D. King, Jr.; Robert B. King, and Earl L. Sailers, III, all of Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Apr. 14, 1981, Ser. No. 254,588
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R 12 Claims

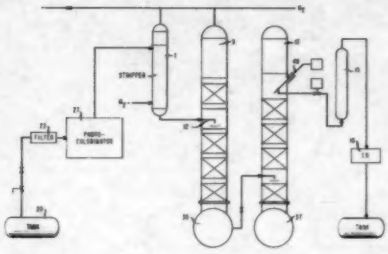
1. A process for producing hydrogen from formate and water wherein an active formate decomposition catalyst is photogenerated from a transition metal carbonyl having a formula $M(CO)_6$ using near ultraviolet light under oxygen free conditions at a temperature of 45° C. and above.

4,372,834

PURIFICATION PROCESS FOR COMPOUNDS USEFUL IN OPTICAL FIBER MANUFACTURE

Robert L. Barns; Edwin A. Chandross, both of Berkeley Heights; Daniel L. Flamm, Chatham Township, Morris County; Louis T. Manzione, Summit, and Larry F. Thompson, Gillette, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 19, 1981, Ser. No. 275,426
Int. Cl.³ B01J 19/08
U.S. Cl. 204—157.1 R 12 Claims



1. A process for purifying chloride glass formers employed in optical fiber fabrication comprising the steps of (1) photochlorinating said chloride glass former by subjecting a source of chlorine and said chloride glass former to ultraviolet light for a desired reaction time wherein the product of the intensity of said ultraviolet light and the length of said reaction time is at least 5×10^5 μW sec/cm^2, (2) removing the bulk of the HCl gas formed by said photochlorination, (3) introducing said chloride glass former in a first distillation column under conditions where the reflux ratio of said first column is at least 8, and then (4) distilling the product from said first distillation column in a second distillation column and recovering the purified glass former from said second distillation column.

4,372,835

SILANE-FUNCTIONALIZED ULTRAVIOLET SCREEN PRECURSORS

Rack H. Chung, Clifton Park, and William D. Kray, Burnt Hills, both of N.Y., assignors to General Electric Co., Waterford, N.Y.

Division of Ser. No. 174,611, Aug. 1, 1980, Pat. No. 4,328,346. This application Jan. 28, 1982, Ser. No. 343,692
Int. Cl.³ C08F 2/50
U.S. Cl. 204—159.13 7 Claims

1. A radiation curable coating composition comprising:

(A) 100 parts by weight of an acid hydrolysis product of an alkoxy-functional silane;

(B) 10 to 1,000 parts by weight of

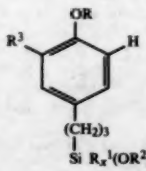
(i) an acryloxy-functional silane;

(ii) a glycidoxy-functional silane; or

(iii) a mixture of (i) and (ii);

(C) a catalytic amount of a photoinitiator; and

(D) from 2 to 15 parts by weight of a silane-functionalized ultraviolet agent precursor compound selected from compounds of the formulae:



(i)

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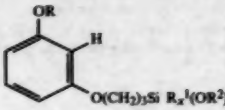
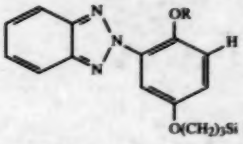
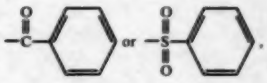


(ii)



(iii)

(iv) a mixture of any of the foregoing, wherein R is



R^1 is C_1–C_6 alkyl, R^2 is C_1–C_6 alkyl or C_2–C_5 alkanoyl, R^3 is hydrogen or C_1–C_6 alkoxyl, x is 0, 1 or 2, y is 1, 2 or 3, and $x+y=3$.

4,372,836

LIGHT CURABLE ACRYLIC DENTAL COMPOSITION WITH CALCIUM FLUORIDE PIGMENT

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, Pilsensee, and Heinz-Joachim Hübner, Seefeld, all of Fed. Rep. of Germany, assignors to Espe Fabrik Parmazeutischer Praparate GmbH, Fed. Rep. of Germany

PCT No. PCT/DE79/00001, § 371 Date Jul. 31, 1979, § 102(e) Date Jul. 31, 1979
PCT Filed Jan. 2, 1979, Ser. No. 185,903
Claims priority, application Switzerland, Jan. 3, 1978, 38/78
Int. Cl.³ C08F 2/50; C08K 3/16
U.S. Cl. 204—159.23 7 Claims

1. In an opaque, photopolymerizable dental filling material comprised of acrylic acid ester compounds comprised of mono or polyfunctional acrylic or methacrylic ester compounds, a photoinitiator and a white pigment, the improvement wherein said material comprises from 1–20 percent by weight of finely divided calcium fluoride as said white pigment, based on the weight of the filling material.

4,372,837

RADIAL FLOW ELECTROFILTER

Frederick D. Watson; Weldon D. Mayse, and Albert D. Franse, all of Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 85,367, Oct. 16, 1979, Pat. No. 4,302,310. This application Jun. 9, 1981, Ser. No. 271,879
Int. Cl.³ B03C 5/00, 5/02
U.S. Cl. 204—186 19 Claims

1. An electrofilter for removal of finely divided solids from liquids of low electrical conductivity comprising:

(a) a vertical cylindrical metallic vessel;

(b) a cylindrical porous bed of a dielectric filtering medium consisting of a non-conductive deformable material having voids and disposed centrally in said vessel, spaced apart from the walls of said vessel, thereby providing an annular space between said bed and said vessel walls;

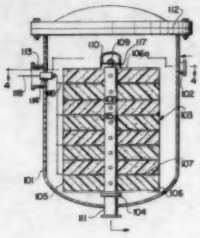
(c) a plurality of annular parallel planar electrodes extending horizontally through at least a major portion of said bed;

(d) fluid inlet means to said vessel fluidly communicating with said annular space;

(e) tubular fluid collector means extending axially through at least a major portion of said bed;

(f) fluid outlet means fluidly communicating with said central tubular collector means; and

(g) conductor means for supplying electrical potential to at



least alternately spaced said electrodes to create electric fields between adjacent electrodes; said porous bed of a dielectric filtering medium, said planar electrodes and said tubular fluid collector means, together with conductor means, constituting a filter pack removably mounted centrally in said vessel.

4,372,838

COAL LIQUEFACTION PROCESS

Conrad J. Kulik, Newark, and Howard E. Lebowitz, Mountain View, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 26, 1981, Ser. No. 247,732

Int. Cl.³ C10G *1/06, 1/00*

U.S. Cl. 208—10 **21 Claims**

1. A process comprising:

contacting a carbonaceous solid with a liquefaction solvent in the presence of gaseous hydrogen under liquefaction conditions in a liquefaction zone to produce a liquefaction effluent comprising a slurry of liquid and solid products;

admixing at least a portion of said liquefaction effluent with a process derived hydrogenation residuum;

separating distillables from said liquefaction effluent and process derived hydrogenation residuum to leave a liquefaction residuum, said distillables having a boiling temperature below about 1000° F.;

treating said liquefaction residuum to separate at least a portion of any solids comprising unconverted coal and mineral matter and form a substantially solids-free residuum;

fractionating said substantially solids-free residuum to form at least a light phase residuum and a heavy phase residuum;

admixing said heavy phase residuum with a process derived hydrogenation distillate to form a mixture, said hydrogenation distillate having a boiling temperature below about 1000° F.;

hydrogenating said mixture of heavy phase residuum and hydrogenation distillate in a hydrogenation zone to convert at least a portion of said heavy phase residuum into a hydrogenation distillate having a boiling temperature below about 1000° F. and leave a hydrogenation residuum;

recycling at least a portion of said hydrogenation distillate to provide said process derived hydrogenation distillate;

recycling at least a portion of said hydrogenation residuum to provide said process derived hydrogenation residuum; and

recovering any remaining hydrogenation distillate as a product.

4,372,839

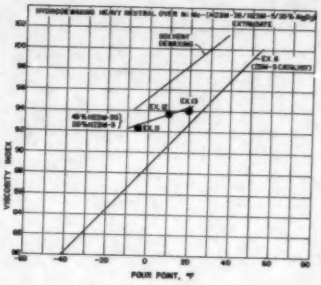
PRODUCTION OF HIGH VISCOSITY INDEX LUBRICATING OIL STOCK

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,777

Int. Cl.³ C10G *11/05, 45/12, 47/16*

U.S. Cl. 208—59 **19 Claims**



1. A process for catalytically dewaxing a waxy hydrocarbon fraction boiling within the approximate range of 450° to 1050° F. to provide a lubricating oil of high viscosity index which comprises contacting said fraction at a temperature between about 500° and about 675° F., a pressure between about 100 and about 3000 psig at a liquid hourly space velocity between about 0.1 and about 10 with a catalyst comprising two different types of crystalline aluminosilicate zeolites, one type which possesses particularly characterized pore openings defined by (1) a ratio of sorption of n-hexane to o-xylene, on a volume percent basis, of greater than 3, which sorption is determined at a P/P_o of 0.1 and at a temperature of 50° C. for n-hexane and 80° C. for o-xylene and (2) by the ability of selectively cracking 3-methylpentane in preference to 2,3-dimethylbutane at 1000° F. and 1 atmosphere pressure from a 1/1/1 weight ratio mixture of n-hexane/3-methylpentane/2,3-dimethylbutane mixture with the ratio of rate constants k_{3MP}/k_{DMB} being in excess of about 2 and the other type selected from the group consisting of ZSM-5 and ZSM-11 and mixtures thereof and recovering a dewaxed oil product.

4,372,840

PROCESS FOR REDUCING COKE FORMATION IN HEAVY FEED CATALYTIC CRACKING

Roby Bearden, and Gordon F. Stuntz, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 108,396, Dec. 31, 1979, Pat. No. 4,280,896. This application May 4, 1981, Ser. No. 259,830

Int. Cl.³ C10G *9/16, 11/18*

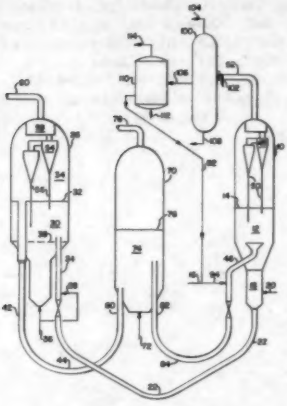
U.S. Cl. 208—113 **11 Claims**

1. A method for reducing the rate of coke and hydrogen production from a hydrocarbon feedstock cracked to lower molecular weight products in a reaction zone containing cracking catalyst of a catalytic cracking system comprising a reaction zone and a reduction zone where the feedstock contains at least one metal contaminant selected from the class consisting of nickel, vanadium, and iron, and where at least some of said metal contaminant becomes deposited on the catalyst such that at least 50 wt. % of the total of said metal contaminant deposited on the catalyst comprises only one of said metal contaminants, and where said metal contaminant contributes to excessive hydrogen and coke production, said method comprising:

A. monitoring the composition of said metal contaminant deposited on the catalyst;

B. adding an effective passivating amount of at least one of said metal contaminants not present as the major contaminant on the catalyst;

C. passing the coke and metal contaminated catalyst from the reaction zone to a regeneration zone maintained at regeneration conditions having a regeneration gas passing therethrough whereby at least a portion of the coke is removed from the catalyst and thereafter the catalyst is passed through a reduction zone maintained at an elevated temperature for a time sufficient to at least partially passivate said metal contaminants on the catalyst while a reducing environment is maintained in said reduction zone by the addition to the reduction zone of material selected from the class consisting of hydrogen, carbon monoxide and mixtures thereof; and,



D. adding a hydrogen donor material into the reaction zone whereby at least a portion of the hydrogen donor material transfers hydrogen to the hydrocarbon feedstock and/or to the cracked lower molecular weight products to decrease the rate of coke formation on the cracking catalyst.

4,372,841

PROCESS FOR REDUCING COKE FORMATION IN HEAVY FEED CATALYTIC CRACKING

Gordon F. Stuntz, and Roby Bearden, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 108,395, Dec. 31, 1979, Pat. No. 4,280,895. This application May 4, 1981, Ser. No. 260,191

Int. Cl.³ C10G *9/16, 11/18*

U.S. Cl. 208—113 **11 Claims**

1. A method for decreasing the rate of coke production from a hydrocarbon feedstock cracked to lower molecular weight products in a reaction zone containing cracking catalyst where the feedstock contains at least two metal contaminants selected from the class consisting of nickel, vanadium and iron and where at least some of the metal contaminants and coke become deposited on the catalyst, said method comprising:

(a) passing the coke and metal contaminated catalyst from the reaction zone to a regeneration zone maintained at regeneration conditions having a regeneration gas passing therethrough whereby at least a portion of the coke is removed from the catalyst and thereafter the catalyst is passed through a reduction zone maintained at a temperature above about 600° C. for a time sufficient to at least partially passivate the metal contaminants on the catalyst, a reducing environment maintained in the reduction zone by the addition to the reduction zone of a material selected from the class consisting of hydrogen, carbon monoxide and mixtures thereof, said passivated catalyst thereafter passing to the reaction zone without further processing; and

(b) adding a hydrogen donor material to the reaction zone whereby at least a portion of the hydrogen donor material transfers hydrogen to the hydrocarbon feedstock and/or to the cracked lower molecular weight products.

4,372,842

CATALYTIC HYDROCRACKING, HYDRODESULFURIZATION, AND/OR HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE AND A ZEOLITE AS THE CATALYTIC AGENT

Lloyd E. Gardner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 145,639, May 1, 1980, Pat. No. 4,324,647. This application Jan. 18, 1982, Ser. No. 340,149

Int. Cl.³ C10G *45/08, 45/10, 45/12*

U.S. Cl. 208—254 H **18 Claims**

1. A process for the catalytic hydrodenitrogenation of an organic nitrogen compound comprising the step of contacting said organic nitrogen compound under suitable hydrodenitrogenation conditions with a catalyst composition comprising zeolite, zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof.

4,372,843

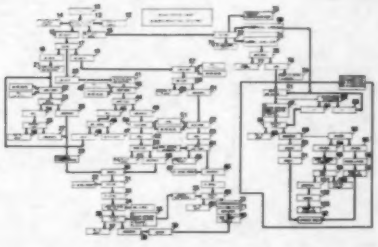
METHOD OF BENEFICIATING PHOSPHATE ORES CONTAINING DOLOMITE

James E. Lawver, Lakeland; Walter O. McClintock, Bartow, and Robert E. Snow, Lakeland, all of Fla., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jun. 2, 1981, Ser. No. 269,449

Int. Cl.³ B03D *1/06*

U.S. Cl. 209—12 **10 Claims**



1. The method of beneficiating a phosphate ore matrix comprising francolite containing a major portion of the phosphate values in said phosphate ore, said ore also including silica and an alkaline earth metal carbonate impurity, the steps comprising:

(a) washing and sizing the ore matrix to deslime the matrix and to remove particles larger than about 6.7 mm;

(b) splitting the deslimed ore matrix into a pebble fraction in which the particles range in size from about 1 mm to about 6.7 mm; a fine fraction having a particle size from about 0.104 mm to about 0.350 mm; a coarse fraction ranging in size from about 0.350 mm to about 0.589 mm; and a fraction having a particle size in the range of 0.589 to 1 mm;

(c) subjecting that portion of the pebble fraction which contains more than about 45% BPL, less than 62% BPL and more than 1% MgO to a heavy media flotation, and thereafter grinding said pebble portion until at least 90%

of sink product will pass through a 42 mesh (Tyler) screen, and thereafter

(d) reagentizing said sink product with water, to about 20–30% solids based on the solids in said sink product, a pH regulator, a carbonate collector comprising a water soluble salt of a sulfonated linear fatty acid having a straight carbon chain from about eight to twenty-two carbons, and a direct carbon to sulfur bond and a phosphate depressant; and

(e) subjecting said reagentized sink product to a reverse flotation to float away the alkaline earth metal carbonate impurity, and collecting as the flotation cell underflow a phosphate concentrate.

4,372,844

AROMATIC AND BENZOTHIOPHENE EXTENDER OIL COMPOSITION FOR ORE FLOATATION

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1981, Ser. No. 278,126
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **9 Claims**

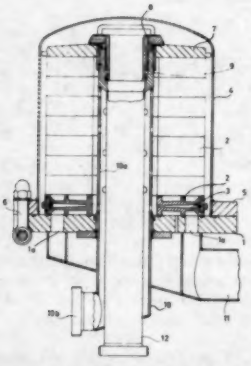
1. A composition of matter useful as an extender oil in a flotation process for recovering phosphates and/or potash from ore containing the same, said composition comprising an extender oil having characteristics of viscosity at 100° F. in a range of about 40 to about 250 SUS and an aromatic content in the range of about 60 to about 85 weight percent of the total oil composition of which about 10 to about 20 weight percent of the total oil composition is chosen from the group consisting of benzothiophenes and dibenzothiophenes.

4,372,845

MULTIPLE HYDROCYCLONE SEPARATOR

Aurel J. Fecske, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 28, 1980, Ser. No. 153,915
Claims priority, application Sweden, Jun. 1, 1979, 7904830
Int. Cl.³ B04C *5/28*
U.S. Cl. 209—211 **6 Claims**



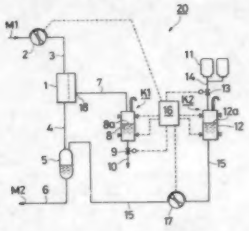
1. In a multiple hydrocyclone separator assembly, the combination of a housing having a generally vertical axis, a plurality of groups of cyclones mounted in the housing at different levels, inlet tube means connected directly to the bottom portion of the assembly for supplying a suspension to the cyclones, each cyclone extending radially from said axis and having at one end an outlet near said axis for discharging a first separated faction of the suspension and at the opposite end an outlet remote from said axis for discharging a second separated fraction of the suspension, and conduit means forming a tubular passage disposed centrally of the housing and extending vertically from said bottom portion of the assembly to a region in the top portion of the housing located above said cyclone groups, said central tubular passage forming an outlet path for said second fraction, the conduit means also forming an annular passage immediately surrounding said central passage and extending coaxially therewith, said annular passage forming an outlet path for said first fraction.

4,372,846

BLOOD PURIFICATION SYSTEM

Seiji Yamagami, Sakai; Hirohiko Nonaka, Oimachi; Tuneyoshi Shimonaru, Suita; Koichi Takashima, Kakogawa, and Yasuhiko Kato, Oimachi, all of Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 244,319
Claims priority, application Japan, Mar. 22, 1980, 55/36751
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—86 **8 Claims**



1. A system for purifying blood comprising filter means for purifying blood; filtrate metering means including a first small container, said first small container having an upper liquid level sensor and a lower liquid level sensor opposed to the side wall of the first small container, the first small container having an inlet channel connected to a filtrate outlet of the filter means and an outlet channel with a valve; blood flow adjusting means provided in an arterial channel for the filter means; a mixer provided in a venous channel of the filter means; a supply source for feeding a substitution fluid to purified blood; substitution fluid metering means including a second small container, said second small container having an upper liquid level sensor and a lower liquid level sensor opposed to the side wall of the second small container, the second small container having an inlet channel connected to the supply source and equipped with a valve and an outlet channel connected to the mixer; replenishment flow adjusting means provided in the outlet channel of the substitution fluid metering means; and control means electrically connected to the filtrate metering means, the substitution fluid metering means, the blood flow adjusting means and/or the replenishment flow adjusting means; the filtrate metering means being controllable to repeat the steps of filling the filtrate from the filter means into its container to a level above the position where the upper liquid level sensor detects the liquid level and thereafter discharging the filtrate from the container until the liquid level lowers to a level below the position where the lower liquid level sensor detects the liquid level, for the control means to calculate the volume of the filtrate discharged from the filter means based on the speed of rise of the liquid level between the upper and lower liquid level detecting positions, the substitution fluid metering means being controllable to repeat the steps of filling the substitution fluid into the second small container to a level above the position where the upper liquid level sensor detects the liquid level and thereafter running off the substitution fluid from the container until the liquid level descends to a level below the position where the lower liquid level sensor detects the liquid level, for the control means to calculate the volume of the substitution fluid supplied to the purified blood based on the speed of

descent of the substitution fluid level, so that the blood is purified while one of the filtrate discharge volume and the substitution fluid supply volume is being controlled based on the other volume to maintain the two volumes in a ratio specified for the patient.

4,372,847

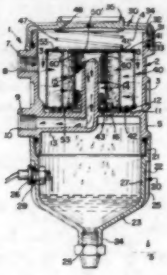
FUEL FILTER ASSEMBLY AND CARTRIDGE

Andrew D. Lewis, Livermore, Calif., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation of Ser. No. 161,863, Jun. 23, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,546

Int. Cl.³ B01D *27/08*

U.S. Cl. 210—86 **13 Claims**



1. An assembly for removing contaminants from a fluid comprising

housing means forming a fluid receiving chamber,

said housing means having an inlet port for introducing a continuous fluid phase having particulate material and emulsified liquids to be removed to said fluid receiving chamber,

said housing means having an output port to direct the fluid to a utilization point,

cartridge means operatively positioned in said fluid receiving chamber and adapted to be selectively removed for replacement,

said cartridge means having at least two concentrically arranged annular sections to receive the fluid introduced through said inlet port in successive order and in a substantially radial inward direction,

the outer section of said annular sections including filtering means to filter the particulate material from said fluid introduced through said inlet port, said filtering means having a filter media disposed therein,

the inner section of said annular section including coalescing means to coalesce the emulsified liquids in said continuous fluid phase, said coalescing means having a coalescing material to cause said emulsified liquid to coalesce into droplets in the continuous fluid phase,

a separator assembly having an annular fine mesh screen, said screen being concentrically arranged within said coalescing means in spaced relationship thereto,

said separator preventing the passage of the droplets formed by said coalescing section and permitting the continuous fluid phase to pass therethrough,

said cartridge means being solely supported in substantially spaced relationship to said housing on an annular raised position creating sealed contact between the bottom of said cartridge means and said housing,

containment means coupled in fluid communication beneath said housing means to collect the coalesced liquid,

fluid passage means positioned within said separator and being in fluid communication with said outlet port to direct the continuous fluid phase passing through said separator to a utilization point, and

said fluid passage means includes a standpipe disposed within said separator assembly in concentric spaced relationship to said fine mesh screen.

4,372,848

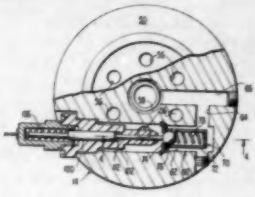
OIL FILTER APPARATUS

Logan J. Manders, P.O. Box 284, Delmar, Del. 19940

Filed May 28, 1981, Ser. No. 268,524

Int. Cl.³ B01D *27/10*

U.S. Cl. 210—90 **11 Claims**



1. In an oil filter system, wherein system oil is pumped in a generally closed loop within a machine to be lubricated, an oil filter releasably mounted upon the machine said oil filter comprising a generally closed oil cannister having at least one oil inlet port fashioned through one end thereof and at least one oil outlet port fashioned through the same end thereof and an oil filter media mounted within the cannister such that system oil may be pumped from a first oil passage within the machine to be lubricated into the cannister via the at least one oil inlet port, through the oil filter media to filter the oil, out of the oil cannister and back into the machine via the at least one oil outlet port in the oil cannister and a second oil passage within the machine to be lubricated downstream of the first oil passage, the improvement comprising:

a disc element operable to be releasably mounted between the oil filter and the machine to be lubricated, said disc element having generally mutually parallel and opposing end surfaces and being operable to abut against and sealingly engage with compatible surfaces on the machine to be lubricated and the one end of the oil cannister respectively;

first disc passage means extending through said disc element from one of said opposing end surfaces to the other and in fluid communication at one end with said at least one oil inlet port into the oil cannister and in fluid communication at the other end with the oil passage within the machine to be lubricated;

second disc passage means extending through said disc element from one of said opposing end surfaces to the other and in fluid communication at one end with said at least one oil outlet port from the oil cannister and in fluid communication at the other end with the second oil passage downstream of the first oil passage, within the machine to be lubricated;

bypass passage means fashioned within said disc element and communicating said first disc passage means and said second disc passage means for permitting oil to bypass the oil filter element through the disc element;

a normally closed check valve positioned within said bypass passage means and having an upstream side in fluid communication with said first disc passage means and a downstream side in fluid communication with said second disc passage means, said check valve being operative to open in response to a predetermined pressure buildup within said first disc passage means;

means for detecting the opening of said check valve such as when a clogged filter element produces a predetermined pressure buildup upstream of said check valve;

warning signal means operably connected to said means for detecting the opening of said check valve; and

an electrical circuit including a transistor switch including a common ground transistor wherein the base of said tran-

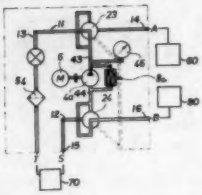
sistor is connected to a ground potential through said check valve means.

4,372,849

HYDRAULIC PUMPING AND SWITCHING APPARATUS

Manfred Klauck, Lebach, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Gerate GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,355
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927971
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—167 8 Claims



1. A hydraulic liquid pumping and switching apparatus for use with an operating liquid supply tank having two connections therewith and a clean liquid tank and a dirty liquid reservoir tank each having a connection therewith, the combination comprising:

a carrier piece; and

a motor, a pump, a filter and a switching device for the hydraulic liquid coupled to said carrier piece,

said switching device having means for selectively delivering hydraulic liquid to a first of the connections with the supply tank from the connection with the clean liquid tank across said filter, delivering hydraulic liquid from the second of the connections with the supply tank across said filter and back to the first of the connections with the supply tank, and delivering hydraulic liquid from the second of the connections with the supply tank to the connection with the dirty liquid reservoir tank without crossing the filter,

said means for selectively delivering comprising

a control housing,

a longitudinal blind bore extending in said control housing,

a pair of valves located in said blind bore,

means, coupled to said valves, for moving said valves to a plurality of positions,

a first set of transverse bores located in said control housing and providing liquid flow, respectively, between one of said valves and said pump, one of the connections with said supply tank and one of the connections with said dirty liquid reservoir tank, and

a second set of transverse bores located in said control housing and providing liquid flow, respectively, between the other of said valves and said pump, the other of the connections with said supply tank and the connection with said clean liquid tank.

4,372,850

REVERSE-PHASE THIN LAYER CHROMATOGRAPHIC PLATE

Tamotsu Okumura, Mino, and Tetsuro Kadono, Neyagawa, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 9, 1981, Ser. No. 252,279
Claims priority, application Japan, Apr. 22, 1980, 55-53814
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.3 14 Claims

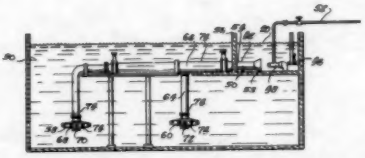
1. A water-resistant thin layer chromatographic plate for reverse-phase thin layer chromatography, comprising: a base plate and a silica or alumina adsorbent wherein 10–40% of the hydroxyl groups of said adsorbent are tri-(lower alkyl)-silylated.

4,372,851

MULTI STAGE FLOCCULATION TREATMENT SYSTEM

Mikkel G. Mandt, Cedar Falls, Iowa, assignor to Clevepak Corporation, White Plains, N.Y.

Continuation of Ser. No. 109,136, Feb. 2, 1980, abandoned, which is a division of Ser. No. 868,801, Jan. 12, 1978, Pat. No. 4,206,052. This application Jul. 24, 1981, Ser. No. 286,712
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—199 4 Claims



1. Multi-stage flocculation treatment apparatus including a first turbulent mixing zone adapted to thoroughly mix influent water to be treated with a flocculant chemical to form a mixed product stream, a second flocculation zone adapted to receive said mixed product stream in a manner to provide relatively low level mixing and to promote floc development, and partition means between said first and second zones;

said first turbulent mixing zone comprising

an induction zone adapted to contain influent water to be treated;

motive jet forming means adapted to receive a minor portion of said influent water under pressure and to discharge said water as a motive jet stream into said induction zone in a manner so as to induct a major portion of said influent water, together with said motive jet stream, into plug flow mixing means;

flocculant chemical introduction means adapted to introduce flocculant chemical into said motive stream at a point prior to, or adjacent to, its discharge from said motive jet forming means; and

plug flow mixing means adapted to receive and thoroughly mix said motive jet stream and inducted influent water to form a mixed product stream having residual energy from said motive jet stream;

said second flocculation zone comprising;

liquid retaining means adapted to retain mixed product for floc development; and

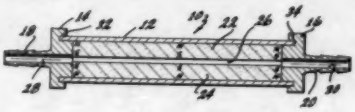
mixed product stream introduction means adapted to introduce said mixed product stream into said retaining means in a manner to utilize said residual energy to provide relatively low level mixing of mixed product within said retaining means; and

said partition means being adapted to maintain influent water to be treated in said first zone in isolation from said second zone, and further being provided with liquid conduit means adapted to permit flow of said mixed product stream from said first zone into said second zone.

4,372,852
MAGNETIC DEVICE FOR TREATING HYDROCARBON FUELS

Albert J. Kovacs, 1929 Fremont Ave., Apt. H, South Pasadena, Calif. 91030

Filed Nov. 17, 1980, Ser. No. 207,644
Int. Cl.³ B01D 35/06
U.S. Cl. 210—222 8 Claims



1. A magnetic device for treating hydrocarbon fuel, including

a hollow elongated casing of non-magnetic material,

the casing including a pair of end portions and with each end portion including a fitting for providing an inlet and outlet for the fuel,

a pair of elongated magnets and with each magnet magnetized to have one pole extending along one longitudinl face and the other pole extending along the opposite longitudinal face and with each longitudinal face having a particular width,

a pair of magnets located within the casing and retained in position by the inner walls of the casing and with faces of the magnets having like poles spaced from each other and substantially parallel to each other and with the distance between the spaced faces of the pair of magnets substantially smaller than the particular width of the spaced faces to form an elongated substantially rectangular cross-section passageway between the magnets for the fuel in communication with the inlet and outlet fittings and with the passageway being substantially free of any ferrous metal, and

the pair of magnets providing a substantially unipolar flux field on fuel flowing in the passageway between the magnets.

4,372,853
REMOVABLE, HERMETICALLY-SEALING, FILTER ATTACHMENT SYSTEM FOR HOSTILE ENVIRONMENTS

Glenn L. Mayfield, Richland, Wash., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 3, 1981, Ser. No. 269,459
Int. Cl.³ B01D 35/02
U.S. Cl. 210—232 15 Claims

1. A removable filter attachment system, comprising:

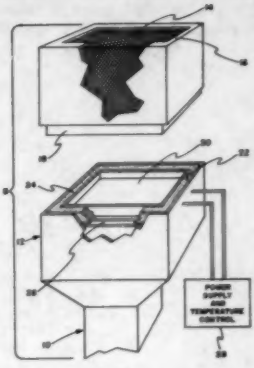
(a) a filter medium having an end;

(b) an annular filter frame fixed to, and surrounding said filter medium, said filter frame having a first longitudinal axis and having a coaxially disposed, annular, first member surrounding said end;

(c) a reusable filter housing having an opening generally matching said end of said filter medium, having a second longitudinal axis, and having a coaxially disposed, annular, second member surrounding said opening, said first and second members together consisting of a rim and a matching, engageable groove;

(d) an environmentally resistant fusible material disposed in said groove, said fusible material having a melting point lower than that of said rim and lower than that of said groove, and said fusible material hermetically bondable, upon melting and resolidifying, with said rim and with said groove; and

(e) attached means operably associated with said rim and groove for electrically resistive heating said fusible material to its melting point without reaching the melting point

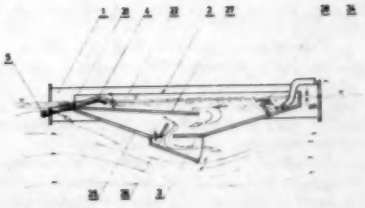


of said rim and without reaching the melting point of said groove.

4,372,854
DEVICE FOR REMOVING FLOATING LIQUID IMPURITIES, OIL, FROM A FLOWING WATER SURFACE

Pal Szereday, Budapest, Hungary, assignor to Novex Foreign Trade Co. Ltd. for Development and Commercialization of Inventions, Budapest, Hungary

PCT No. PCT/HU80/00007, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01720, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 8, 1980, Ser. No. 290,806
Claims priority, application Hungary, Dec. 12, 1979, AI 291
Int. Cl.³ B01D 17/02
U.S. Cl. 210—242.3 3 Claims

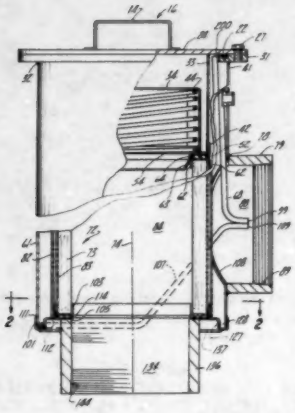


1. A device for removing floating liquid impurities, particularly oil, from a flowing or forced-flowing water surface, comprising: a structural unit partly submerged in water, and having wall elements surrounding a range of water level lowered in relation to said surface, a tank-like submersion body with a bottom of a submersion depth first increasing downstream and then gradually decreasing downstream from a front end provided with an adjustable spillway of vertically variable position as compared to said submersion body, connected to said front end, said submersion body having on its open front end facing the direction of water flow, a swirl restricting diffusion grid, running essentially parallel with the direction of water flow, position in or under the dividing level between the surface water layer to be separated, and an opening at the deepest point on the submersion body, said opening being of adjustable cross-section and located above the zone of greatest flowing speed and of smallest pressure, and a deflection hopper surrounding said opening and being adjustable for locally increasing the outside flowing speed.

4,372,855
FILTER DEVICE WITH AIR BLEED

Borje O. Rosaen, 4031 Thornoaks Dr., Ann Arbor, Mich. 48104, and Dale P. Fosdick, 7000 Austin Rd., Saline, Mich. 48176

Filed Apr. 29, 1981, Ser. No. 258,670
Int. Cl.³ B01D 29/10
U.S. Cl. 210—316 9 Claims



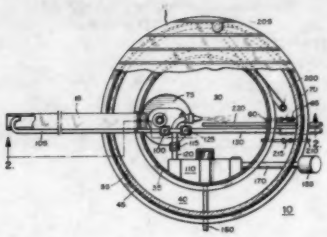
1. A fluid filtering device comprising:
a housing having an axis, said housing defining an interior chamber,
a fluid inlet port formed at one end of the housing and open to said chamber,
a fluid outlet port formed on the side of the housing and open to said chamber,
a filter element positioned within said chamber and fluidly between said fluid ports, said filter element dividing said interior chamber into an annular outlet chamber open to said outlet port and an inlet chamber open to said inlet port,
first air bleed means for evacuating air from said chamber and to said outlet port when the axis of said housing is substantially vertically oriented,
second air bleed means for evacuating air from said chamber and to said outlet port when the axis of said housing is substantially horizontally oriented, and
wherein said first and second air bleed means respectively comprise a first and second tube, said tubes being open at at least one end, said tubes being positioned in said outlet chamber and wherein the open end of each tube is positioned within the outlet port so that the open ends of said tubes face outwardly from said outlet port.

4,372,856
PROCESS AND SYSTEM FOR ANAEROBIC TREATMENT OF WASTE

Jon R. Morrison, Box 315, Rte. 1, Dewey, Ill. 61840

Filed Mar. 30, 1981, Ser. No. 249,265
Int. Cl.³ C02F 3/28; B01D 21/06, 19/04
U.S. Cl. 210—603 30 Claims

1. In an anaerobic digestive process, a method of purifying bio-gas comprising:
forming a slurry of waste and water;
introducing the slurry into a mix tank;
mixing while heating the slurry in the mix tank;
removing light and heavy nondigestible materials from the slurry;
collecting ammonia gas produced in the mixing process;
introducing the slurry into an anaerobic digest tank;
collecting bio-gas produced in the digestive process from the digest tank;
dissolving at least a part of the ammonia gas in a liquid contained in a scrub tank to prepare a scrubbing solution;

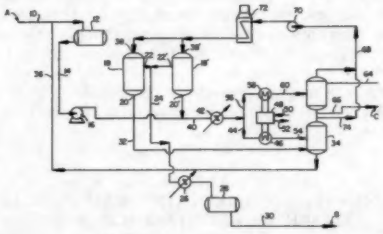


subsequently passing said bio-gas through said scrubbing solution in said scrub tank to remove carbon dioxide and hydrogen sulfide from said bio-gas; and
collecting said purified bio-gas.

4,372,857
LIQUID ADSORPTION PROCESS AND APPARATUS

William G. Matthews, Bridgewater, N.J.; Jean-Paul Sicard, Putnam Valley, and Richard A. Anderson, Katonah, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 5, 1981, Ser. No. 240,860
Int. Cl.³ B01D 15/00
U.S. Cl. 210—673 15 Claims



1. An adsorption process for separating an adsorbate comprising at least one more preferably adsorbable component from a feedstock liquid mixture containing a non-adsorbate comprising at least one less preferably adsorbable component from said feedstock, which comprises:
(i) providing in a first zone a first quantity of adsorbent material which preferentially adsorbs said adsorbate component of said mixture with respect to said non-adsorbate component;
(ii) providing in a second zone a second quantity of adsorbent material;
(iii) providing a relatively non-adsorbing, fluid permeable material in a third zone in contact with said first and second zones;
(iv) removing said adsorbate from said mixture by the steps of:
(a) flowing said feedstock mixture into said first zone;
(b) contacting said mixture with said first quantity of adsorbent material thereby preferentially adsorbing said adsorbate component of said mixture in said first quantity of adsorbent material, producing a non-adsorbate effluent essentially free of said adsorbate;
(c) discharging said non-adsorbate effluent through said third zone;

(v) regenerating the adsorbent materials

(a) substantially removing the non-adsorbed components of said mixture from said first and third zones;

(b) introducing a regenerating fluid, comprising a major proportion of a non-adsorbable gas and a minor proportion of a molecular species strongly adsorbable by said adsorbent material, into said second zone in a direction countercurrent to the direction of feedstock flow in step iv(a) thereby substantially removing said strongly adsorbable molecular species from said non-adsorbable gas into said second quantity of adsorbent material;

(c) passing the non-adsorbable gas from said second zone countercurrently through said third zone and said first zone thereby desorbing said adsorbate from said first zone of adsorbent material into the non-adsorbable gas; and

(d) discharging the non-adsorbable gas containing the desorbed adsorbate from said first zone.

4,372,858

METHOD OF REGENERATING ION EXCHANGERS

Günter Ritter, Melle, Fed. Rep. of Germany, assignor to Tetra Werke Dr. rer. nat. Ulrich Baensch Gesellschaft mit beschränkter Haftung, Melle, Fed. Rep. of Germany

Continuation of Ser. No. 180,704, Aug. 25, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,593

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934863

Int. Cl.³ C02F *1/42*

U.S. Cl. 210—674 **2 Claims**

1. A method of regenerating an ion exchange resin used in the treatment of water while attaining a desired calcium to magnesium-ion ratio in the range of about 1.15 to 0.04 to 1 in the regenerated resin, the method comprising the steps of rinsing the loaded resin with a solution containing calcium and magnesium chelates of potassium salts of EDTA with the calcium and magnesium ions included in a selected mole ratio in the range of about 7.6 to 1 to about 0.2 to 1 whereby the calcium to magnesium ratio in the regenerated resin decreases as the amount of magnesium chelates increases.

4,372,859

METHOD OF REMOVING MINUSCULE SOLID PARTICLES FROM LIQUID AND SYSTEM THEREFOR

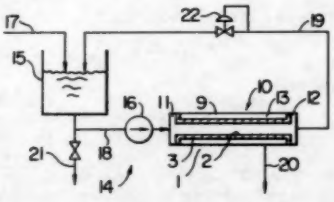
Yoshikazu Sugimoto; Kiyotaka Shirosaki; Masashi Kawaguchi, and Masaki Takeshima, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Kyowa Kogyo, Ltd., both of Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,201

Claims priority, application Japan, Aug. 10, 1979, 54-101252

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—739 **23 Claims**



1. A method of removing minuscule solid particles from liquid comprising:

supplying a liquid to be processed containing minuscule solid particles to one end of at least one filter element open at opposite ends and formed with a multiplicity of tiny openings in a wall including a first surface and a second surface, to allow the liquid to flow along the first surface;

causing a portion of the liquid to flow through the tiny openings in the wall by reducing the pressure on the second surface of the wall of the filter element below the pressure on the first surface thereof, so that filtrate can be drawn off out of the second surface of the wall;

allowing the rest of the liquid to flow out of the filter element through the other end thereof; and

controlling the flow velocity F of the liquid flowing along the first surface and/or the flow velocity f of the filtrate flowing through the tiny openings in the wall toward the second surface in such a manner that the ratio F/f can be kept at a predetermined value.

4,372,860

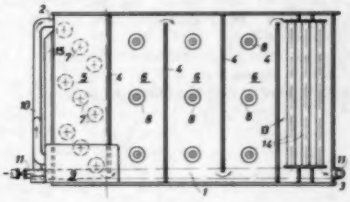
METHOD AND AN APPARATUS FOR CLEANING WATER IN A SWIMMING POOL

Povl Kaas, Herning, Denmark, assignor to H. & P. Kaas System Teknik ApS, Herning, Denmark

Filed Feb. 24, 1981, Ser. No. 237,776

Int. Cl.³ C02F *1/32*

U.S. Cl. 210—748 **11 Claims**



1. A method of cleaning chlorinated water in a swimming pool by circulating the water through a container, in which it is treated by ultraviolet radiation, characterized in that the water in the container is carried through a plurality of flow chambers connected in series in such a manner that in the first chamber the water is carried through a plurality of heating bodies located transverse to the flow, and in a plurality of succeeding flow chambers said water is treated by a plurality of ultraviolet radiation lamps with a predetermined radiation of light with the wave length $\lambda > 300$ nm.

4,372,861

GRAPHITE DISPERSION

Tai S. Chao, Olympia Fields; Aubrey C. Smith, Jr., Harvey, and Frederic D. Smies, Homewood, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

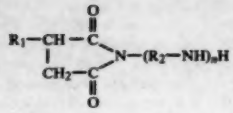
Filed May 4, 1981, Ser. No. 260,529

Int. Cl.³ C10M *1/20, 1/32*

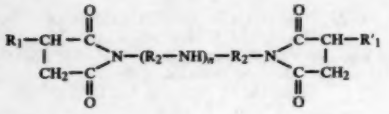
U.S. Cl. 252—29 **12 Claims**

1. A method for improving the yield and stability of a graphite-in-oil dispersion comprising: grinding graphite powders to form graphite particles having an average diameter in the range of from about 2 microns to about 15 microns in the presence of an oxygen-containing atmosphere so that said graphite particles have an oxygen content in the range of about 1% to about 7% of total weight of the graphite particles including oxygen, and dispersing at least a portion of said graphite particles into an oil to form a graphite-in-oil dispersion wherein a dispersing amount is added during said dispersing of a dispersing agent selected from the group consisting of:

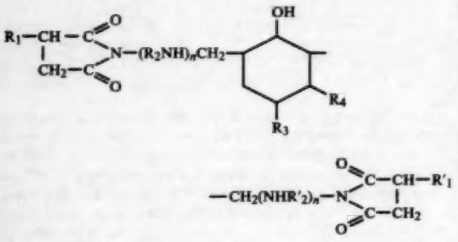
(i) a mono-succinimide of the following formula:



wherein:
n is in the range of about 0 to about 7;
R_1 is hydrocarbyl radical having a molecular weight in the range of from 400 to about 3000; and
R_2 is a hydrocarbyl radical having from about 2 to about 7 carbon atoms;
(ii) a bis-succinimide of the following formula:



wherein:
n is in the range of about 0 to about 7;
R_1 and R_1' are independently selected hydrocarbyl radicals each having a molecular weight in the range of from about 400 to about 3000; and
R_2 is a hydrocarbyl radical having from about 2 to about 7 carbon atoms; and
(iii) a compound having the following formula:



wherein:
n is in the range of from about 0 to about 7;
R_1 and R_1' are independently selected from the group of hydrocarbyl radicals having a molecular weight in the range of about 500 to about 5000;
R_2 and R_2' are independently selected hydrocarbyl radicals each containing from about 2 to about 7 carbon atoms; and
R_3 and R_4 are independently selected from the group consisting of hydrogen and a hydrocarbyl radical containing from about 1 to about 20 carbon atoms.

4,372,862

OIL-SOLUBLE METAL CONTAINING SULFONATED POLYMERS USEFUL AS OIL ADDITIVES

Harold N. Miller, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 10, 1980, Ser. No. 195,847
Int. Cl.³ C10M *1/40*; C10L *1/24*
U.S. Cl. 252—33 **23 Claims**

1. A composition comprising
a major amount of a lubricating oil or a liquid petroleum fuel; and
a hydrocarbon soluble ethylene-containing ionic polymer useful as a V.I.-dispersant additive, having a number average molecular weight in the range of about 5000 to 1,000,000, substantially free of polar cosolvent, formed by sulfonating an aliphatic olefin polymer comprising about 30 to 84.5 mole % ethylene, about 15 to 69.5 mole % C_3 to C_{18} alpha olefin and about 0.5 to 20 mole % of C_5 to C_{14} diolefin, with a non-chlorine-containing sulfonating agent, to form sulfonic acid groups, said sulfonated polymer being at least partly neutralized with a metal compound wherein said metal is selected from the group consisting of multivalent metals,
wherein when said composition comprises a major amount of said lubricating oil, said composition contains 0.01 to 10 wt. % of said ionic polymer; and wherein when said composition comprises a major amount of said fuel, said composition contains 0.001 to 0.5 wt. % of said ionic polymer.

4,372,863

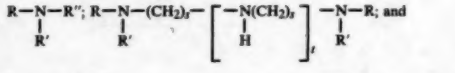
OIL COMPOSITIONS CONTAINING OIL-SOLUBLE, OXIDATIVELY AND MECHANICALLY DEGRADED ETHYLENE COPOLYMERS

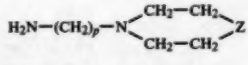
Robert L. Elliott, Scotch Plains; Lawrence J. Engel, Green Brook, and J. Brooke Gardiner, Mountainside, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 911,693, Jun. 1, 1978, abandoned, which is a continuation of Ser. No. 787,033, Apr. 13, 1977, abandoned. This application Oct. 2, 1979, Ser. No. 81,050
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 A **6 Claims**

1. A lubricating oil composition comprising a major amount of lubricating oil and a viscosity index improving amount of an oil-soluble oxidatively and mechanically degraded ethylene copolymer having an ethylene content of from about 26–79 weight percent ethylene, from about 1.0–25 wt. % of a C_1–C_{21} alkyl norbornene and the balance being at least one C_3 to C_{18} alpha-olefin, said copolymer having a number average molecular weight (M_n) of at least 5,000; a molecular weight distribution as determined by the ratio of weight average molecular weight (M_w) to number average molecular weight (M_w/M_n) of less than 8; and, a thickening efficiency in the range of 1.0 to 3, when compared to polyisobutylene having a viscosity average molecular weight (M_v) of 20,000 and, an oxygen content of from about 0.005 to 6 wt. % based on the total weight of said copolymer.

4. A composition according to claim **1** wherein said copolymer is reacted with an amount of an amine compound selected from the group consisting of nitrogen compounds having the general formulae:





wherein R, R′ and R″ are independently selected from the group consisting of hydrogen; C_1 to C_{25} straight or branched chain alkyl radicals; C_1 to C_{12} alkoxy C_2 to C_6 alkylene radicals; C_2 to C_{12} hydroxy alkylene radicals; C_2 to C_{12} amino alkylene radicals; C_1 to C_{12} alkylamino C_2 to C_6 alkylene radicals; Z is 0 or N; G is from the group consisting of hydrogen and Ω-amino alkylene radicals of from 1 to 3 carbon atoms; s is a cardinal number of from 2 to 6; t is a cardinal number of from 0 to 10; and p is an integer of from 1 to 4 sufficient to provide a nitrogen content of said copolymer ranging from about 0.01 to 0.5 weight percent.

4,372,864

REAGENT FOR FROTH FLOTATION OF BITUMINOUS COAL

James R. McCarthy, 623 Nevin Ave., Sewickley, Pa. 15143

Filed Dec. 15, 1977, Ser. No. 860,899
Int. Cl.³ B03D 1/00
U.S. Cl. 252—61 4 Claims

1. A bituminous coal floating reagent comprising:

a. liquid hydrocarbon having a paraffinic base for wetting bituminous coal in water,

b. a reducing material effective in an amount sufficient to establish a reducing environment around said bituminous coal for breaking any oxygen control on the surface thereof and to form hydrogen sulfide in acid water, the reducing material being phosphorous pentasulfide and

c. an activator material in an amount effective to provide a cation contained in the liquid hydrocarbon capable of establishing an electrostatic charge on said bituminous coal after any oxygen control on the surface has been broken.

4,372,865

CARBONATE/HYDROXIDE COPRECIPITATION PROCESS

Bu-Fan B. Yu, Butler, and Alex Goldman, Pittsburgh, both of Pa., assignors to Spang Industries, Inc., Butler, Pa.

Filed Sep. 26, 1980, Ser. No. 191,012
Int. Cl.³ C04B 35/38
U.S. Cl. 252—62.62 9 Claims

1. Method for carbonate-hydroxide coprecipitation of materials for manufacture of magnetically soft ferrites and for controlling characteristics of such coprecipitated materials comprising

forming an aqueous metal ion solution of ferrous ions and divalent ions of at least one other metal in which the divalent metal ions of said at least one other metal are selected from the group consisting of Mn++, Ni++, Mg++, and Zn++,

providing a base solution of carbonates and hydroxides by combining in solution carbonate ion and hydroxide ion source materials selected from the group consisting of ammonium carbonate, ammonium bicarbonate, ammonium hydroxide, sodium carbonate, sodium hydroxide, potassium carbonate, and potassium hydroxide,

the base solution having a pH of about eleven,

combining such metal ion solution and such base carbonate and hydroxide ion solution to form a reaction liquor for precipitation of metal carbonates and metal hydroxides, the reaction liquor having a pH between about 7.5 and about 8.5, and

controllably limiting physical agitation applied in combining such metal ion and base solutions by limiting mixing times of such solutions between about five and about thirty seconds and controllably holding the resulting slurry of metal carbonate-hydroxide precipitate in mother liquor substantially free of applied physical agitation for a time sufficient to effect formation of spherical particles having a size between about one and about ten microns in diameter.

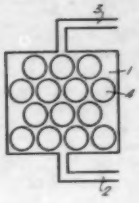
4,372,866

HEAT STORAGE MEDIUM OF NAOH-H_2O-TEO_2

Joern Ehlers, Uetersen, and Helmut Haukelt, Hamburg, both of Fed. Rep. of Germany, assignors to The British Petroleum Company Limited, London, England

Filed Jun. 3, 1981, Ser. No. 269,812
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020983; Japan, Jun. 3, 1980, 3020984
Int. Cl.³ C09K 3/18
U.S. Cl. 252—70 4 Claims

1. A heat storage medium consisting of 70 to 74% by weight of sodium hydroxide, 30 to 26% by weight of water and 0.1 to 2.0% by weight of tellurium dioxide, expressed as a percentage



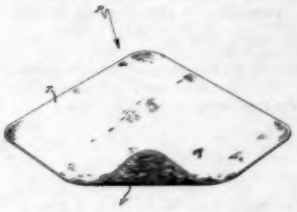
by weight of the combined weight of sodium hydroxide and water.

4,372,867

UPHOLSTERY CLEANING PAD AND METHOD OF MAKING THE SAME

Peter Taragos, 216 - 20th Ave., NE, Minneapolis, Minn. 55418

Filed May 11, 1981, Ser. No. 153,746
Int. Cl.³ C11D 17/00; B08B 1/00
U.S. Cl. 252—91 2 Claims



2. A multi-ply upholstery cleaning pad formed of a fabric having a terry cloth ply and a velour ply, said pad having been immersed in a collodial suspension containing predetermination amounts of sodium lauryl sulfate, sodium perborate, the suspension being maintained at room temperature during the time the fabric pad is immersed therein, the fabric pad being allowed to slowly partially dry to a damp condition and thereafter rapidly drying the pad to a dry condition, whereby the cleaning pad is permeated with a dried cleaning compounds.

4,372,868

PROCESS FOR THE PREPARATION OF A STABLE, READILY SOLUBLE GRANULATE WITH A CONTENT OF BLEACH ACTIVATORS

Herbert Saran; Martin Witthaus, both of Düsseldorf; Eduard Smulders, Hilden, and Karl Schwadtke, Leverkusen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,097
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3011998
Int. Cl.³ C11D 3/30, 3/395, 11/00, 17/06
U.S. Cl. 252—102 30 Claims

1. A process for preparing bleach activator granulates comprising from about 90 to 98 percent by weight of bleach activator and from about 10 to 2 percent by weight of granulating adjuvant, based on the weight of the anhydrous components, which consists essentially of the steps of:

(a) mixing for a time sufficient to form a homogeneous mixture powdered bleach activator which has a mean particle size of from about 0.01 to 0.8 mm with from about 50 to

100 percent by weight of the total granulating adjuvant to be used, which granulating adjuvant comprises a water-soluble cellulose ether, starch, or starch ether in the form of a free-flowing powder having a mean particle size of from about 0.01 to 0.8 mm;

(b) moistening the mixture from step (a) with water or an aqueous solution containing the remainder of the granulating adjuvant in a solution of from about 0.1 to 10 percent by weight, based on the weight of the total solution;

(c) granulating the moist mixture from step (b); and

(d) drying the moist granulate from step (c) at an elevated temperature not exceeding 100° C. until the moisture content is less than 2 percent by weight.

22. A bleach activator granulate prepared according to the process of claim **1**.

23. A process of activating an aqueous solution of percompounds selected from the group consisting of hydrogen peroxide and water-soluble peroxyhydrates containing from 5 to 500 mg of active oxygen per liter of solution, which comprises incorporating into said solution a bleach activator granulate of claim **22**.

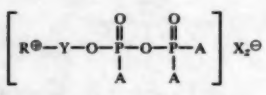
4,372,869

DETERGENT COMPOSITIONS

Martin K. O. Lindemann, Bridgewater; Elvin R. Lukenbach, Somerset, and Robert J. Verdicchio, Succasunna, all of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed May 15, 1981, Ser. No. 263,954
Int. Cl.³ C11D *17/00*
U.S. Cl. 252—174.16 **7 Claims**

1. A detergent and cleansing composition wherein the active ingredient consists essentially of from about 1.0 to 20.0 % by weight of the total composition of a compound of the formula



(I)

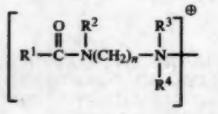
wherein

A is selected from —O, —OM and —O—Y—R with the proviso that at least one A is —O;

X is an anion;

z is an integer from 0 to 3;

R is an amidoamine moiety of the formula



wherein:

R^1 is alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 carbon atoms each, or aryl or alkaryl of up to 20 carbon atoms;

R^2 is hydrogen or alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms or polyoxyalkylene of up to 10 carbon atoms;

R^3 and R^4, which may be the same or different, are selected from alkyl, hydroxyalkyl, carboxyalkyl or up to 6 carbon atoms in each alkyl moiety, and polyoxyalkylene of up to 10 carbon atoms; in addition, R^3 and R^4 taken together with the nitrogen to which they are attached, may represent an N-heterocycle, in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;

n is an integer from 2 to 12;

Y is alkylene or alkylene interrupted by up to 3 oxygen atoms, of up to 12 carbon atoms, which alkylene chain may be substituted with lower alkyl, alkoxy, hydroxy or hydroxyalkyl, of not more than 10 carbon atoms each;

M is selected from the group of hydrogen, an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or a salt radical selected from alkali metals and alkaline earth metals.

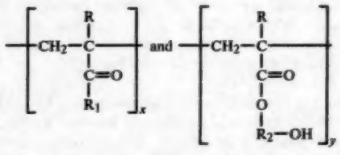
4,372,870

METHOD AND COMPOSITION FOR TREATING AQUEOUS MEDIUMS

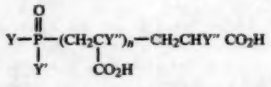
William R. Snyder, Warminster, Pa., and Diane Feuerstein, Old Greenwich, Conn., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jul. 24, 1981, Ser. No. 286,497
Int. Cl.³ C02F *5/14*
U.S. Cl. 252—180 **22 Claims**

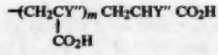
1. Composition for treating an aqueous medium, said composition comprising an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer (I) have the following formula



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM, or NH_2 where M is a water soluble cation; R_2 is a lower alkyl of from about 2–6 carbon atoms and the molar ratio of x to y is about 34:1 to 1:4, and an effective amount of a water soluble telomeric phosphinocarboxylic acid compound (II) of the formula



or salts thereof, wherein Y" is hydrogen or a methyl or ethyl residue; Y is hydrogen, a straight or branched alkyl residue having from 1–18 carbon atoms, a cycloalkyl residue having from 5–12 carbon atoms, an aryl residue, an aralkyl residue, a residue of the formula:



wherein Y" has its previous significance; and the sum of n and m is an integer of at most 100; or a residue -OX wherein X is hydrogen or a straight or branched alkyl residue having 1–4 carbon atoms and Y' is a residue -OX, wherein X has its previous significance and wherein the molar ratio of said polymer (I) to said phosphinocarboxylic acid compound (II) is about 10:1 to 1:10.

4,372,871

NEMATIC LIQUID CRYSTALS FOR DISPLAY DEVICES

Kazuhisa Toriyama; Tamihito Nakagomi, both of Mobara; Hisato Sato, Tokyo; Yutaka Fujita, Yokohama; Katsuhiko Morita, Urawa, and Yoshi Arai, Oyama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc. and Hitachi Ltd., both of Tokyo, Japan

Division of Ser. No. 968,675, Dec. 12, 1978, abandoned. This application Nov. 5, 1980, Ser. No. 204,292

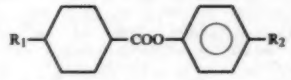
Claims priority, application Japan, Dec. 16, 1977, 52/150513

Int. Cl.[3] C09K 3/34; G02F 1/13

U.S. Cl. 252—299.61 12 Claims

1. In a multiplexed twisted nematic liquid crystal display device, the improvement comprising as said nematic liquid crystalline composition a mixture of

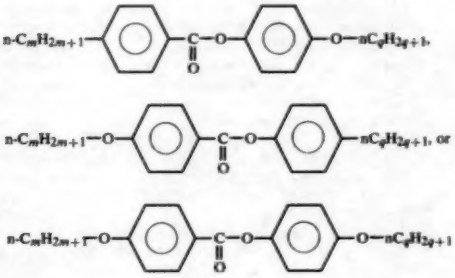
A. at least one nematic liquid crystalline compound of the formula



wherein R_1 represents n-C_mH_{2m+1}, R_2 represents n-C_qH_{2q+1}-O, and m and q each represent an integer of 1 to 10;

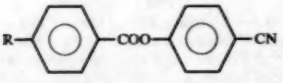
and at least one of the following components B, C and D:

B. at least one colorless, chemically stable nematic liquid crystalline compound having negative dielectric anisotropy of the general formula

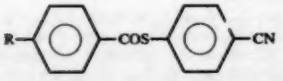


m and q each represent an integer of from 1 to 10, or a homolog thereof,

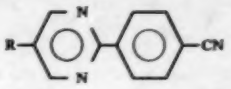
C. at least one colorless, chemically stable nematic liquid crystalline compound having large positive dielectric anisotropy selected from the group consisting of compounds of the general formulas



wherein R represents n-C_mH_{2m+1} or n-C_mH_{2m+1}-O, and m represents an integer of 1 to 10; compounds of the general formula

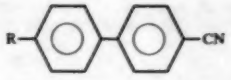


wherein R represents n-C_mH_{2m+1}, and m represents an integer of from 1 to 10, and compounds of the general formula

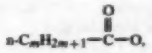


wherein R represents n-C_mH_{2m+1}, and m represents an integer of from 1 to 10, or homologs of said compounds; and

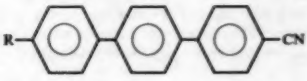
D. at least one colorless, chemically stable nematic liquid crystalline compound having small positive dielectric anisotropy selected from the group consisting of compounds of the general formulas



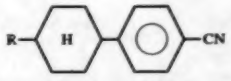
wherein R represents n-C_mH_{2m+1}, n-C_mH_{2m+1}-O, or



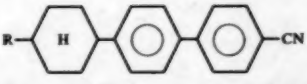
and m represents an integer of from 1 to 10,
compounds of the general formula



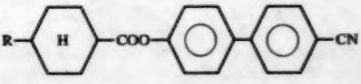
wherein R represents n-C_mH_{2m+1}, and m represents an integer of from 1 to 10,
compounds of the general formula



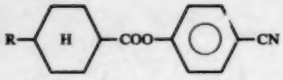
wherein R represents n-C_mH_{2m+1}, and m represents an integer of from 1 to 10,
compounds of the general formula



wherein R represents n-C_mH_{2m+1}, and m represents an integer from 1 to 8,
compounds of the general formula



wherein R represents n-C_mH_{2m+1}, and
m represents an integer of from 1 to 10, and compounds of the general formula



wherein R represents n-C_mH_{2m+1}, and m represents an integer of from 1 to 10,
or homologs of said compounds;
said mixtures comprising
(1) about 43.3% to about 60% by weight of A, about 21.7% to about 30% by weight of B, and about 10% to about 35% by weight of C,
(2) about 40% to about 90% by weight of A, 0% to about 30% by weight of B, and about 10% to about 40% by weight of D, or
(3) about 23.3% to about 49% by weight of A, 0% to about 19.5% by weight of B, about 10% to about 30% by weight of C and about 10% to about 60% by weight of D.

4,372,872

SULFUR SUSPENSIONS

Peter S. Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 17, 1981, Ser. No. 234,465
Int. Cl.³ B01J *13/00*
U.S. Cl. 252—313 R **22 Claims**

1. A process for producing a suspension of sulfur particles which comprises the steps of (a) agitating an aqueous medium, contained within a vessel, with a high shear mixer; and (b) introducing sulfur into the agitated medium.

18. A suspension of sulfur particles in an aqueous medium prepared according to the process of claim **1**.

4,372,873

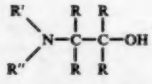
VANADIUM-AMINE CORROSION INHIBITOR SYSTEM FOR SOUR GAS CONDITIONING SOLUTIONS

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,446
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—389 R **8 Claims**

1. A corrosion inhibited composition consisting essentially of

a. an aqueous alkanolamine solution in which the alkanolamine has the formula:



wherein R′ and R″ independently represent hydrogen or $-CR_2CR_2OH$ and wherein each R may be hydrogen or an alkyl radical of 1 or 2 carbon atoms, employed in CO_2 gas removal service,

b. an anion containing vanadium in the plus 4 or plus 5 valence state and having a concentration in the composition of at least 100 parts per million and

c. an amine co-inhibitor having a concentration in the composition of at least 0.4 weight percent and selected from the group consisting of N-aminoethylethanolamine, ethylenediamine, propylenediamine, piperazine, N-aminoethylpiperazine, methyliminobispropylamine and lower alkyl and N-hydroxyalkyl substituted derivatives thereof, where lower alkyl has one to four carbon atoms.

4,372,874

STABILIZATION OF HYDROLYSIS PRONE LABILE ORGANIC REAGENTS IN LIQUID MEDIA

Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 722,565, Sep. 13, 1976, abandoned, Ser. No. 764,826, Feb. 2, 1977, Pat. No. 4,153,511, Ser. No. 775,833, Mar. 9, 1977, Pat. No. 4,310,624, and Ser. No. 919,159, Jun. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 775,833, , which is a continuation-in-part of Ser. No. 764,826, , which is a continuation of Ser. No. 667,857, Mar. 17, 1976, abandoned, and a continuation-in-part of Ser. No. 722,565, Sep. 13, 1976, abandoned. This application Nov. 13, 1980, Ser. No. 206,467
The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.
Int. Cl.³ C12N *9/00*; **C09K** *3/00*; **G01N** *33/48*; **C12Q** *1/00*
U.S. Cl. 436—176 **48 Claims**

1. A method for stabilizing a labile organic reagent which is unstable in aqueous media and stable in nonaqueous media, comprising in combination the steps of:

(a) dissolving at least one organic reagent selected from the group consisting of adenosine monophosphate, adenosine diphsophate, adenosine triphosphate, phosphoadenylic acid sulfate, adenosylmethionine, uridine diphosphate, cytidine diphosphate, coenzyme A, tetrahydrofolic acid, biotin, thiamine pyrophosphate, pryidoxal phosphate, nicotinamide mononucleotide, cell haemin, B_{12} coenzyme, NADP, NADPH, purine nucleotides, pyrimidine nucleotides, cholesterol, magnesium thymolphthalein monophosphate, dithioerythritol, dithiothreitol, N-acetyl cysteine, glutathione, mercaptoethanol, o-cresolphthalein complexone, N-acetyl cystine, gamma glutamyl-p-nitroanilide, bilirubin, paranitrophenyl phosphate, phenolphthalein monophosphate, glycerol phosphate, p-nitroanilide, p-nitrophenol, ascorbic acid, tetraphenylboron, phosphoenol pyruvate, B-NAD and hydrated $NADH_2$, in a water miscible organic solvent which is liquid at room temperature and which is nondegradatively reactive with such organic reagent to form a solution of such organic reagent in the organic solvent; and

(b) providing in contact with the solution at least one percent by weight of an inert, high surface area, particulate desiccant for entrapping water to provide a residual water content in the solution below about 0.5% by weight; and

(c) sealing the solution.

2. The method as recited in claim **1** further comprising the step of removing substantially all of the desiccant from the solution prior to sealing the solution.

24. The method as recited in claim **1** wherein the desiccant is not removed from the solution.

46. A product prepared by the method of claim **24** comprising the solution sealed with the desiccant.

4,372,875

METHOD FOR OBTAINING AND REUSING OF OXIDATION CATALYST IN THE WITTEN DMT PROCESS

Heinrich Bünger, Siegburg; Rudolf Cordes, and Gerhart Hoffmann, both of Niederkassel, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 156,605, Jun. 5, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,280
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923681
Int. Cl.³ B01J *31/40*; **C07C** *69/82*
U.S. Cl. 252—413 **15 Claims**

1. A process for obtaining and reusing a heavy metal oxidation catalyst in the production of dimethyl terephthalate by the extraction of high-boiling distillation residues, said residues being produced during the oxidation of mixtures which contain p-xylene and/or methyl p-toluate in the liquid phase with oxygen or an oxygen-containing gas at an elevated pressure

and elevated temperature in the presence of the dissolved heavy metal oxidation catalyst, subsequent esterification of the oxidation product with methanol at elevated pressure and elevated temperature, and separation of the esterification product by distillation into a crude dimethyl terephthalate fraction, a fraction rich in methyl p-toluate, and a high-boiling distillation residue, with water or dilute aqueous solutions of low-molecular weight aliphatic monocarboxylic acids or alcohols and recycling of the extract which contains the heavy metal oxidation catalyst trimellitic acid and the monomethyl ester of trimellitic acid into the oxidation stage, optionally after concentration, characterized in that in the extract the quantitative ratio a/b of the concentration (a) in gram/liter of trimellitic acid plus the monomethyl ester of trimellitic acid to the concentration (b) in gram/liter of heavy metal oxidation catalyst is reduced to a value of no more than 1.8:1 and that in the oxidation stage the catalyst concentration c, expressed in p.p.m., is represented by the formula: $c=44-(a/b)+d$, with 60 p.p.m. $\leqq d \leqq 300$ p.p.m., and with the ratio of a/b having said value prior to the recycling of the extract.

4,372,876

ZEOLITE MOLECULAR SIEVE ADSORBENT FOR AN AQUEOUS SYSTEM

Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 217,946, Dec. 18, 1980, Pat. No. 4,333,769, which is a continuation-in-part of Ser. No. 146,533, May 2, 1980, Pat. No. 4,319,928. This application Mar. 1, 1982, Ser. No. 353,683

Int. Cl.³ B01J *20/18*

U.S. Cl. 252—430 **15 Claims**

1. An adsorbent comprising both a crystalline aluminosilicate and an inorganic matrix wherein said crystalline aluminosilicate is dispersed in said inorganic matrix, said adsorbent suitable for use in a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with said adsorbent, said adsorbent exhibiting an adsorptive selectivity towards said component, said adsorbent being coated with a cellulose ether to substantially reduce the disintegration of said adsorbent.

4,372,877

DI(ACYLPEROXY)-1,4-CYCLOHEXANE DIMETHANOL-BIS-CARBONATES

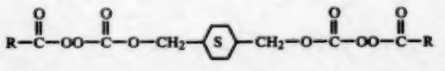
David Peterson, Hercules, Calif., assignor to U.S. Peroxygen Company, Richmond, Calif.

Filed Nov. 5, 1981, Ser. No. 318,308

Int. Cl.³ C07C *179/14*

U.S. Cl. 260—453 RZ **5 Claims**

1. Di(acylperoxy)-bis-carbonates of the formula:



wherein each R has up to 20 carbon atoms and is alkyl or phenyl, wherein phenyl may contain alkyl, halo or alkoxy ring substituents.

4,372,878

PROCESS FOR THE PREPARATION OF AN ALUMINUM SILICATE CATALYST FOR CONVERTING METHANOL CONTAINING WATER AND/OR DIMETHYL ETHER CONTAINING WATER INTO LOWER OLEFINS

Friedrich Wunder, Flörsheim; Ernst I. Leupold, Neu-Anspach; Horst Hachenberg, Walluf; Hans-Joachim Schmidt, Königstein, and Klaus Unger, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,438

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008146

Int. Cl.³ B01J *29/06*

U.S. Cl. 252—455 Z **2 Claims**

1. A process for the preparation of a crystalline zeolite catalyst for converting methanol containing water and/or dimethyl ether containing water into lower olefins, which comprises silanizing a naturally occurring chabazite/erionite mixture and subsequently heating the product to 300° C. to 600° C. in the presence of oxygen or of gases containing oxygen.

4,372,879

LI-SPINEL CATALYST FOR NON-OXIDATIVE DEHYDROGENATION PROCESS

Gilbert R. Germaine, and Jean P. Darnanville, both of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1981, Ser. No. 333,007

Claims priority, application France, Dec. 29, 1980, 80 27673

Int. Cl.³ B01J *23/04, 23/22, 23/26, 23/78*

U.S. Cl. 252—470 **15 Claims**

1. A catalyst for the non-oxidative dehydrogenation at elevated temperatures in the presence of steam of hydrocarbons to the corresponding more-unsaturated hydrocarbons which comprises a composition having a spinel structure with lithium coordinated in the spinel structure, an alkali metal oxide not forming part of the spinel structure and a vanadium oxide not forming part of the spinel structure.

4,372,880

USE OF SUBSTITUTED 2-(1-METHYLBUTYL)-1,3-DIOXANES AS PERFUMING AGENTS

Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

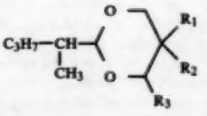
Filed Apr. 15, 1981, Ser. No. 254,516

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016007

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **20 Claims**

1. A perfumery composition consisting essentially of from about 1 to 50 percent by weight of at least one substituted 2-(1-methylbutyl)-1,3-dioxane of the formula



(I)

wherein R_1 is a hydrogen atom or a methyl or ethyl group; R_2 is a methyl, ethyl, n-propyl, isopropyl, n-butyl, or sec.-butyl group; and R_3 is a hydrogen atom or an n-propyl or isopropyl group, with the proviso that the sum of the carbon atoms of the radicals R_1, R_2, and R_3 is equal to or less than 6, as perfuming agent, and the remainder of customary constituents of perfumery compositions.

4,372,881

UNSATURATED ALICYCLIC COMPOUNDS, THEIR USE AS PERFUMING AND FLAVORING INGREDIENTS

Günther Ohloff, and Wolfgang K. Giersch, both of Bernex, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

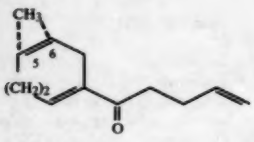
Filed Sep. 29, 1981, Ser. No. 306,827

Claims priority, application Switzerland, Oct. 16, 1980, 7729/80

Int. Cl.³ C07C 45/66; A61K 7/46

U.S. Cl. 252—522 R 5 Claims

1. A compound of formula



(I)

having a methyl radical bound to the carbon atom in position 5 or 6 of the ring.

4,372,882

DETERGENT COMPOSITION CONTAINING LOW LEVEL OF SUBSTITUTED POLYAMINES

Robertus J. C. Koster, Grimbergen; Volker Six, Strombeek-Bever, and Peter Hale, Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

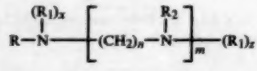
Filed Jun. 16, 1981, Ser. No. 274,128

Claims priority, application United Kingdom, Jun. 17, 1980, 8019680

Int. Cl.³ C11D 3/30, 3/37, 11/03, 17/06

U.S. Cl. 252—529 3 Claims

1. A method for preparing a granular detergent composition of enhanced soil release and cleaning properties, said composition comprising from about 2% to about 60% of a surface-active agent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents and mixtures thereof, and from 0.1% to 1.2% by weight of a polyamine having the formula



wherein R is an alkyl or alkenyl group having 10 to 22 carbon atoms, the R_1's, which are identical or different, are ethylene oxide or propylene oxide, R_2 is hydrogen, C_1–C_4 alkyl or $(R_1)_y$, where x, y, and z are numbers such that the sum $(x+y+z)$ is in the range from 2 to about 25, n is a number from 1 to about 6, and m is a number from 1 to about 9, whereby a 1% aqueous solution of the composition has an alkaline pH (20° C.), said method comprising the steps of

(a) spray drying a slurry including the surface-active agent and not the polyamine to produce a base powder,

(b) spraying polyamine free of other detergent active ingredients onto a composition comprising the base powder.

2. A method as recited in claim 1, wherein the polyamine has the formula as set forth in claim 1 wherein R is hydrogenated C_{16-18} alkyl, R_1 is ethylene oxide, R_2 is ethylene oxide, n is 3, m is 1 or 2 and x, y, and z are each at least 1 and their sum is from 3 to 12, and is present in the composition in a level from 0.25% to 0.75%.

3. The product produced by the process of claim 2.

4,372,883

PROCESS FOR THE PRODUCTION OF VACCINE

Tyoku Matuhashi, Kawaguchi; Mitsuko Usui, Tokyo; Akio Yamamoto, Higashikurume; Masakazu Mitsuhashi, and Shunsaku Koyama, both of Okayama, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Aug. 18, 1980, Ser. No. 178,904

Claims priority, application Japan, Sep. 5, 1979, 54-112848

Int. Cl.³ A61K 39/385; C07G 7/00

U.S. Cl. 260—112 R 5 Claims

1. A process for the production of vaccine, consisting of the steps of:

covalently attaching a biologically toxic substance to a saccharide selected from the group consisting of pullulan, elsinan and partial hydrolysates of pullulan or elsinan having an average molecular weight of 500 to 1,000,000, to form a biologically toxic substance-saccharide conjugate in which the biologically toxic substance is detoxified; and

collecting the resultant conjugate.

4,372,884

PHARMACEUTICALLY ACTIVE PEPTIDES

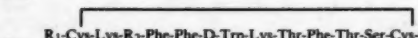
Marvin R. Brown, San Diego; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, all of Calif., assignors to The Salk Institute For Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 602,259, Aug. 6, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 675,149

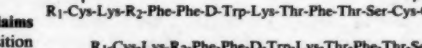
Int. Cl.³ C07C 103/52

U.S. Cl. 260—112.5 S 42 Claims

1. A pharmaceutically active compound, said compound being a peptide selected from the group consisting of



R_1-Cys-Lys-R_2-Phe-Phe-D-Trp-Lys-Thr-Phe-Thr-Ser-Cys-OH, and



R_1-Cys-Lys-R_2-Phe-Phe-D-Trp-Lys-Thr-Phe-Thr-Ser-Cys-OH,

where R_1 is an acyl group derived from the group consisting of amino acids, dipeptides, tripeptides, pentapeptides, aliphatic, aromatic and cyclic organic acids having from 1 to 10 carbon atoms or hydrogen and R_2 is selected from Ala and Asn.

4,372,885

BISAZO DYES CONTAINING A 2-AMINO-SUBSTITUTED THIAZOLE RADICAL

Heinz Eilingsfeld, Frankenthal; Guenter Hansen; Guenther Seybold, both of Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

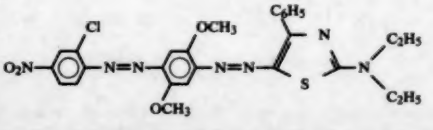
Filed Aug. 4, 1978, Ser. No. 931,248

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735751; Apr. 15, 1978, 2816505

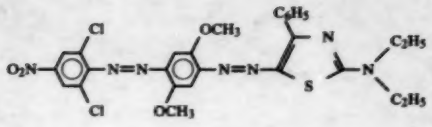
Int. Cl.³ C09B 31/14; D06P 1/18, 3/36, 3/54

U.S. Cl. 260—158 2 Claims

1. A compound of the formula:



2. A compound of the formula:



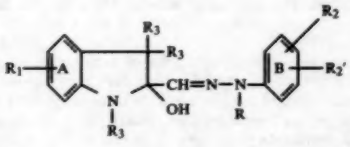
4,372,886

PROCESS FOR THE PRODUCTION OF CARBINOL BASES FROM INDOLINE COMPOUNDS

Rudolf Zink, Therwil, and Peter Loew, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,956
Claims priority, application Switzerland, Jun. 11, 1980, 4491/80
Int. Cl.³ C09B 55/00; C07D 211/72, 211/73
U.S. Cl. 260—165 9 Claims

1. A process for the production of a carbinol base of the formula



wherein

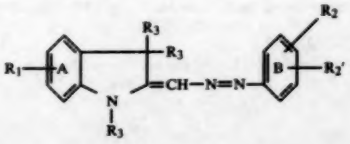
R is methyl or ethyl,

each R_3 independently is a C_1–C_4alkyl group,

R_1 is hydrogen or halogen,

R_2 is hydrogen, a C_1–C_4alkyl radical, a C_1–C_4alkoxy radical, a phenoxy radical, an azobenzene radical or a radical of the formula $—O—(CH_2)_n—OR_4$, wherein n is 1 or 2 and R_4 is a C_1–C_4alkyl radical, a phenyl radical, or, when n is 1, R_2 and R_2' are ortho to each other and together form a fused ring of formula $—O—CH_2—OCH_2—$, and otherwise R_2' is hydrogen

which process comprises alkylating 1 mole of a dye base of the formula



or an acid (HX) salt thereof

wherein X is any anion, in aqueous alkaline medium having a pH value of at least 10, with at least 2 moles of a compound that introduces the radical R.

4,372,887

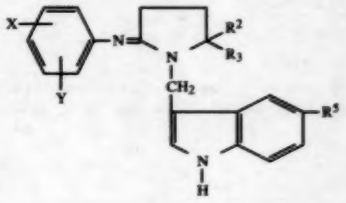
IMINOPYRROLIDINYLINDOLES

Yao H. Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 95,891, Nov. 19, 1979, Pat. No. 4,259,238, which is a division of Ser. No. 818,623, Jul. 25, 1977, Pat. No. 4,196,212, which is a division of Ser. No. 609,885, Sep. 2, 1975, Pat. No. 4,049,714, which is a division of Ser. No. 466,753, May 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 255,701, May 22, 1972, Pat. No. 3,816,454, which is a continuation-in-part of Ser. No. 47,589, Jun. 18, 1970, abandoned. This application Nov. 24, 1980, Ser. No. 209,436
Claims priority, application Canada, Feb. 8, 1971, 104786; Apr. 11, 1973, 168449; Belgium, May 22, 1973, 131415; France, May 21, 1973, 73 188366; Fed. Rep. of Germany, May 21, 1973, 2325759; Japan, May 21, 1973, 48-55757; United Kingdom, May 22, 1973, 24380/73; Netherlands, May 22, 1973, 7126/73; United Kingdom, May 22, 1973, 16343/74
Int. Cl.³ C07D 403/06; A61K 31/40
U.S. Cl. 548—468 6 Claims

1. A compound selected from the group consisting of iminopyrrolidinylindoles of Formula II

Formula II



and pharmaceutically acceptable acid addition salts thereof wherein

X and Y are independently selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkoxy of from 1 to 4 carbon atoms inclusive, lower alkyl of from 1 to 4 carbon atoms inclusive;

R^2 and R^3 are independently selected from the group consisting of hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive; and

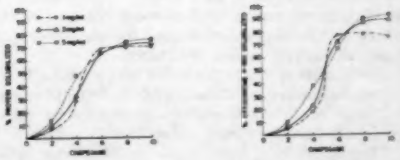
R^5 is hydrogen, halogen or lower alkoxy of from 1 to 4 carbon atoms inclusive.

4,372,888

NONDENATURING ZWITTERIONIC DETERGENTS

Leonard M. Hjelmeland, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

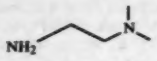
Continuation-in-part of Ser. No. 181,465, Aug. 26, 1980, abandoned. This application Aug. 19, 1981, Ser. No. 294,203
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 6 Claims

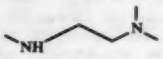


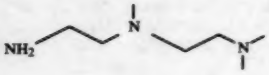
1. A nondenaturing zwitterionic detergent for protein consisting of an effective amount of 3-[(3-cholamidopropyl)dimethylammonio]-1-propanesulfonate in a water carrier.

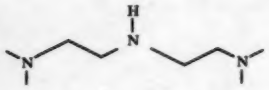
6. A process for producing a nondenaturing zwitterionic detergent for protein derived from the reaction of an acid

selected from one member of a group of carboxylic acids consisting of cholic acid, deoxycholic acid, and dehydroabietic acid reacted with a polyethyleneamine selected from one member of the group consisting of

(1)


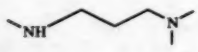
(2)


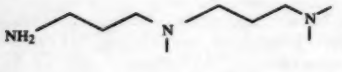
(3)


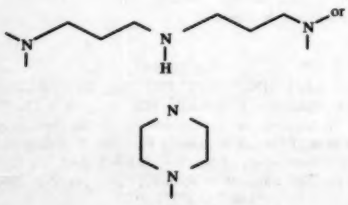
(4)


or reacted with a polypropyleneamine selected from one member of the group consisting of

(1)

(2)


(3)


(4)


and reacted with an alkylating agent selected from one member of the group consisting of propanesultone, butanesultone, sodium 3-Cl,2-OH-propanesulfonate, sodium 2-Br-ethane sulfonate, and sodium chloroacetate wherein

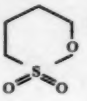
(1) said carboxylic acid is reacted with an amine to form a triethylammonium salt in the solvent tetrahydrofuran;

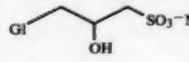
(2) after the salt is completely dissolved, ethyl chloroformate is added and the flask is cooled to 0° C. and a precipitate forms which is triethylamine hydrochloride which is filtered away from the mixed anhydride;

(3) the product, mixed anhydride, reacts with a polyamine to form the polyamine derivative of a carboxylic acid amide as well as ethanol and carbon dioxide by products;

(4) the polyamine is reacted with an alkylating agent selected from one member of the group consisting of

(1) Propanesultone,

(2) Butanesultone,


(3)

Sodium 3-Cl, 2-OH—, Propanesulfonate,

(4)

Sodium 2-Br Ethanesulfonate, or

(5)

Sodium chloroacetate,

to give the betaine.

4,372,889

PREPARATION OF CARBOXYLIC ACIDS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 219,786, Dec. 24, 1980, abandoned. This application May 28, 1981, Ser. No. 267,963

Int. Cl.³ C07C *51/14*

U.S. Cl. 260—413 **4 Claims**

1. A process for the preparation of a carboxylic acid which comprises reacting an olefin with carbon monoxide in the presence of water, in the presence of a molybdenum-nickel co-catalyst or a tungsten-nickel co-catalyst, in the presence of a halide and in the presence as a promoter of an organophosphorus compound or an organo-nitrogen compound wherein the phosphorus and nitrogen are trivalent.

4,372,890

PLATINUM COMPOUND

Chikao Yoshikumi, Kunitachi; Takayoshi Fujii, Tokyo; Kenichi Saito, Tokyo; Masahiko Fujii, Tokyo, and Koichi Niimura, Sayama, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

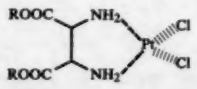
Filed May 21, 1981, Ser. No. 265,838

Claims priority, application Japan, Jun. 11, 1980, 55-78783

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **6 Claims**

1. A platinum compound having a formula



wherein R represents hydrogen atom, an alkali metal atom or a lower alkyl group.

4,372,891

METHOD OF RECOVERING PURE TOLUENE DIISOCYANATE FROM A POLYMERIC RESIDUE PRODUCT

Lloyd E. Hilbert, Kanawha Ter., St. Albans, W. Va. 25177, and Randall H. Samples, 1912 Springs Rd., Mt. Airy, N.C. 27030

Continuation of Ser. No. 74,934, Sep. 23, 1970, abandoned. This application Dec. 15, 1976, Ser. No. 750,901

Int. Cl.³ C07C *119/048*

U.S. Cl. 260—453 SP 8 Claims

1. A method of recovering toluene diisocyanate from a residue product remaining after the original manufacturing process and resulting from the distillation of toluene diisocyanate down to levels of toluene diisocyanate where the residue in the original manufacturing process makes further evaporation impractical and containing residual toluene diisocyanate together with polymeric materials consisting essentially of the steps of: combining the residuel product with a solvent to dissolve the toluene diisocyanate while leaving the polymeric materials undissolved in suspension; said solvent consisting essentially of an aliphatic hydrocarbon in the molecular weight range between dodecane and hexane and a hydrocarbon from the group consisting of aromatic and chlorinated hydrocarbons having a boiling point approximating that of the said aliphatic hydrocarbon, the ratio of said aliphatic hydrocarbon to said aromatic hydrocarbons being in the range 90:10 and 10:90 and separating the dissolved toluene diisocyanate from the undissolved suspended polymeric materials by filtration.

4,372,892

PROCESS FOR THE PREPARATION OF 1-AMINOBENZENE-5-β-SULFATOETHYLSULFONE-2,4-DISULFONIC ACID, THE 5-VINYLSULFONE COMPOUND AND THE ALKALI SALTS THEREOF

Hermann Fuchs, Kelkheim; Gustav Kapaun, Neuenhain, and Fritz Meininger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

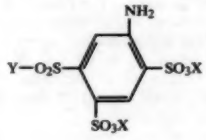
Continuation of Ser. No. 127,790, Mar. 5, 1980, abandoned, which is a division of Ser. No. 703,530, Jul. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 514,921, Oct. 15, 1974, abandoned. This application Jun. 24, 1981, Ser. No. 276,807

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1973, 2352058

Int. Cl.³ C07C *141/00, 143/58*

U.S. Cl. 260—458 C 2 Claims

1. A process for preparing a compound of the formula



wherein Y is

$$XO_3S—O—CH_2—CH_2—$$

and X is hydrogen which comprises:

dissolving or suspending 1-aminobenzene-3-β-sulfatoethylsulfone or 1-aminobenzene-3-β-hydroxyethylsulfone in anhydrous sulfuric acid (monohydrate) at a temperature between about −15° C. and about +40° C. and subsequently adding to it a sulfuric acid/sulfur trioxide mixture having a mixture ratio of 30:70 to 90:10, in the temperature range indicated above, the amount of sulfur trioxide being such that the molar ratio of the starting aminobenzene compound to sulfur trioxide is about 1:2.5 to 1:6 where it contains the β-sulfatoethylsulfonyl group, or is about 1:3.5 to 1:7 where it contains the β-hydroxyethylsulfonyl group, and subsequently heating to a temperature of from about 100° to about 150° C.

4,372,893

METHOD FOR REDUCTION OF REDUCIBLE GROUPS

Heiner Eckert, Lerchenauerstr. 9, D-8000 München 40, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,333

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012674

Int. Cl.³ C07C *121/78, 85/11, 85/12*

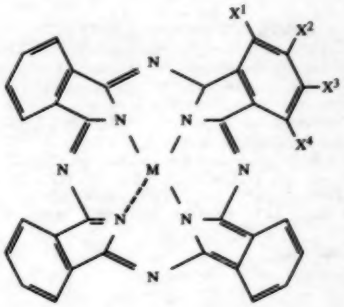
U.S. Cl. 260—465 E 10 Claims

1. Improved method for reduction of reducible groups containing C-atoms or N-atoms or a combination of these, which can be carried out selectively, preserving sensitive, reducible groupings, the improvement being that for optional selective reduction under normal pressure conditions of

(a) the NO_2, NO, or oximen group, there is used a metal macrocyclic in prereduced form, the metal macrocyclic being selected from the group consisting of:

(1) metallic phthalocyanine, especially of the general formula II

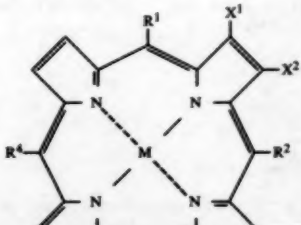
(II)



in which x^{1-4} represent H, halogens such as Cl, F, or cyano,

(2) a metalporphyrin of the general formula III

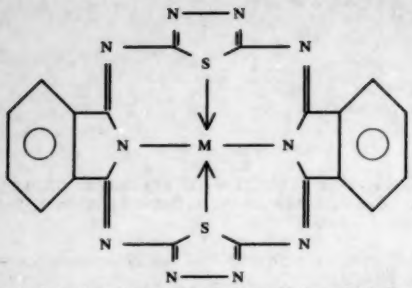
(III)



in which R^1 to R^4 represent H, phenyl or low alkyl and X^1, X^2 stand for H, halogens such as chlorine, bromine or cyano; and

(3) a mixed cycle of the general formula IV

(IV)



which can be substituted in the benzoid ring with halogens or cyano groups, the metal in the macrocyclic being Fe, Co, Ni, Mn, Ti, V or Cr, which may be in ion form, or

(b) the NO_2, NO, oxime groups and/or a double-bond, a combination of said metal macrocyclic is used with an additional reducing agent, said additional reducing agent being a sodium boranate, lithium alanate or a reaction product thereof with alcohol or hydrogen, when said metal macrocyclic is one of the formula II.

4,372,894

PHOSPHONOFORMIC ACID ESTERS

Ake J. E. Helgstrand; Karl N. Johannson, both of Enhörna; Alfons Misiorny, Bandhagen; Jan O. Noren, Grödinge, and Göran Stening, Soödertälje, all of Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden

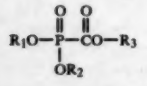
Continuation-in-part of Ser. No. 971,689, Dec. 2, 1979, abandoned. This application Nov. 13, 1979, Ser. No. 93,166

Claims priority, application United Kingdom, Dec. 22, 1977, 53580/77; Dec. 22, 1977, 53581/77; Dec. 22, 1977, 53582/77; Dec. 22, 1977, 53583/77; Jul. 3, 1978, 28548/78; Jul. 3, 1978, 28552/78; Jul. 3, 1978, 28553/78; Jul. 3, 1978, 28555/78

Int. Cl.³ C07F *9/40*; A61K *31/66*

U.S. Cl. 260—941 **18 Claims**

1. A compound of the formula



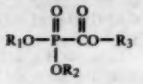
I

wherein one of R_1 and R_2 is H and the other of R_1 and R_2 is a phenyl group of the formula

II

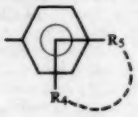
wherein R_4 and R_5 are the same or different and each is selected from the group consisting of hydrogen, halogen, alkyl having 1, 2, or 3 carbon atoms, alkoxy having 1, 2, or 3 carbon atoms, alkoxycarbonyl having 2–7 carbon atoms; and alkylcarbonyl groups having 2–7 carbon atoms; or R_4 and R_5 together form a straight saturated alkylene chain having 3 or 4 carbon atoms and being bound to adjacent positions, i.e. 2,3- or 3,4- in the phenyl ring and R_3 is H; and physiologically acceptable salts and optical isomers thereof.

2. A compound of the formula



(I)

wherein one of R_1 and R_2 is H and the other of R_1 and R_2 is a phenyl group of the formula



(II)

wherein R_3 is a phenyl group of formula II, wherein R_4 and R_5 are the same or different and each is selected from the group consisting of hydrogen, halogen, alkyl having 1, 2, or 3 carbon atoms, alkoxy having 1, 2, or 3 carbon atoms, alkoxycarbonyl having 2–7 carbon atoms; and alkylcarbonyl groups having 2–7 carbon atoms; or R_4 and R_5 together form a straight saturated alkylene chain having 3 or 4 carbon atoms and being bound to adjacent positions, i.e. 2,3− or 3,4− in the phenyl ring; and physiologically acceptable salts and optical isomers thereof.

4,372,895

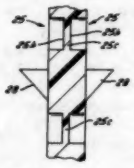
DISC FOR AERATION OF SEWAGE

Edward P. Saffran, Waukesha, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Apr. 28, 1980, Ser. No. 144,480

Int. Cl.³ B01F *9/08*; C02F *3/18*

U.S. Cl. 261—92 **6 Claims**



1. A rotatable disc for aerating and moving liquid such as sewage in a circular channel and having a hub for mounting on a drive shaft and flat parallel faces normal to the hub axis, said disc being of a diameter and constructed for rotation at speeds such that the air is carried as a gas to below the surface of the liquid, each face having a multiplicity of substantially round recesses of generally equal size, the depth of each recess being greater than one-half of and not greater than the diameter of the recess.

4,372,896

DEVICE ADAPTED TO CORRECT THE AIR-FUEL RATIO OF THE MIXTURE DELIVERED BY A CARBURETOR DURING THE PERIODS OF OPERATION AT LOW LOADS OF A MOTOR VEHICLE ENGINE

Francesco Bellicardi, and Renato Vitto, both of Bologna, Italy, assignors to Weber S.p.A., Bologna, Italy

Continuation of Ser. No. 156,803, Jun. 5, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,407

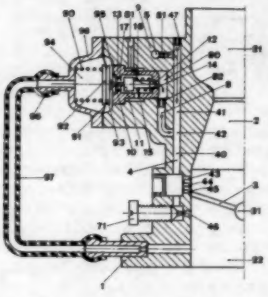
Claims priority, application Italy, Jun. 8, 1979, 3432 A/79

Int. Cl.³ F02M *7/24*

U.S. Cl. 261—121 B **8 Claims**

1. A correction device for correcting the air-fuel ratio of the mixture delivered by a carburetor in particular in the periods of operation at low loads of the motor vehicle engine, comprising

a first channel formed in the body of the carburetor, which channel communicates, at one end, with a fuel delivering circuit and with the atmosphere, respectively, through two conduits having each a passage bore of pre-established cross-section, and at the other end, through a plurality of bores, with the intake conduit of the carburetor in a zone located near the rim of the throttle, characterized in that opening into the said first channel, in a position downstream of the outlet of said fuel delivering circuit, is a first end of a second channel formed in the body of the carburetor, the said second channel being provided with a bore of pre-established cross-section arranged to meter a flow of secondary air supplied to the said first



channel, at the other end of the said second channel, upstream of said bore therein of pre-established cross section, there being disposed a cavity formed in the body of the carburetor and closed by a cover fixed thereon, a device to close said second channel being disposed inside said cavity, said device comprising a bushing coaxial with said cavity and housed therein having a plurality of radial holes communicating with the atmosphere and an axial hole communicating with said second channel, a needle valve floating inside said bushing and adapted to close said axial hole against the action of a spring housed inside the bushing, and means to urge said needle valve in response to the variations of the vacuum in the said intake conduit downstream of the throttle valve of the carburetor.

4,372,897

DUAL SHEET CAPILLARY HEAT EXCHANGER

William G. Sanderson; Richard B. Sumner, and Loren G. Kragh, all of Tacoma, Wash., assignors to Tower Systems Inc., Tacoma, Wash.

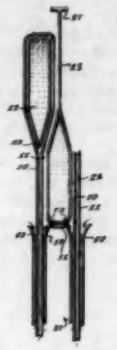
Filed Apr. 16, 1981, Ser. No. 254,605
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—153 **15 Claims**

1. A heat exchanger comprising in combination:

at least one enclosure comprising two substantially parallel flexile and wettable sheet sidewalls sealed together along their vertical edges and open along their top and bottom edges and disposed sufficiently proximate to each other to create capillary attraction between the sheets when a liquid is introduced therebetween;

means suspending the enclosure;

a liquid carrying header disposed above the top edge opening in the enclosure and having means for dispensing liquid into the enclosure; and



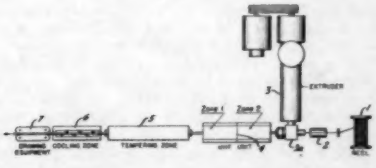
means passing a fluid across the outside surface of at least one of the sidewalls of the enclosure in heat exchange relation with the liquid within the enclosure.

4,372,898

PROCESS OF CROSSLINKING ELECTRICAL INSULATORS OF PLASTIC OR RUBBER

George Menges, Aachen-Laurensbert; Klaus Kircher, Aachen-Richterich, and Bernd Franzkoch, Aachen Stettiner, all of Fed. Rep. of Germany, assignors to Paul Troester Maschinenfabrik, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 6,778, Jan. 26, 1979, abandoned. This application Jul. 25, 1980, Ser. No. 173,190
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803252
Int. Cl.³ B29C *13/04*
U.S. Cl. 264—22 **17 Claims**



1. A process for making electrical insulators which comprises uniformly mixing an insulating and electrically inactive crosslinkable polymer material selected from the group consisting of plastic and synthetic rubber with a crosslinking agent which is excitable in an ultra-high frequency alternating current electromagnetic field to produce radicals for effecting crosslinking of said polymer material, and which by subjection to said field in the crosslinking process are decomposed or converted into a decomposition or reaction product which is not excitable by an alternating current electric field, forming said mixture into the form of the insulators to be produced, and thereafter subjecting said formed mixture to an ultra-high frequency alternating current electromagnetic field to activate said crosslinking agent to effect crosslinking of said polymer material and to decompose or convert said crosslinking agent to a decomposition or reaction product not excitable by an alternating current electric field, said crosslinking agent being selected from the group consisting of t-butylperbenzoate, t-butylperoxide-3,5,5 trimethylhexanoate, 2,5-di-benzoylperoxy-2,5 dimethylhexane, di-tributyl peroxyterephthalate, 1, 1-di-tributylperoxy-3,5,5-trimethyl cyclohexane, 2-methyl-2-cumylperoxy-5-ketotetrahydrofuran, 3-tributylperoxy-3-

phenylphthalide and 3-t-butylperoxy-3 (p-chlorphenyl) phthalide, said mixture being free of electrically active material which retains its electrical activity after subjection to said field.

4,372,899

METHOD OF MANUFACTURING PARTICLEBOARD AND THE LIKE

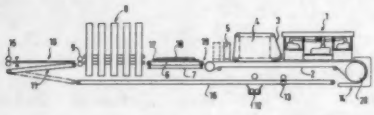
Dieter Wiemann, Barsinghausen; Günter Seeger, and Berndt Greten, both of Springe, all of Fed. Rep. of Germany, assignors to Bison-Werke Bahre & Greten GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,478

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012676; Apr. 1, 1980, 3012677; Apr. 1, 1980, 3012678; Apr. 1, 1980, 3012679

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—25 **31 Claims**



4. Apparatus for manufacturing sections of particleboard comprising a forming conveyor, which extends between a mat carrier feeding station having a direction changing drum for turning over the mat carriers and a mat carrier transfer station and is guided beneath a stationary scattering station for scattering a mat of particulate material onto mat carriers forwarded on said forming conveyor; means for continuously driving said forming conveyor; a cut-off saw associated with said forming conveyor for separating said mat into mat sections; a transport and storage unit for supplying the mat carriers, which are each laden with a respective mat section, to a manufacturing press; and also mat carrier return means for returning the mat carriers to the mat carrier feeding station; wherein the transport and storage unit for the laden mat carriers comprises an accelerating conveyor extending between said mat carrier transfer station and said manufacturing press, said manufacturing press consisting of a discontinuously working single storey press having its own transport device which clamps onto side edges of each mat carrier after an initial infeed movement of the mat carriers; a device for separating pressed boards and mat carriers; and a reversible guide conveyor provided at the outlet of the press for returning the mat carriers without turning them over; and wherein means for steplessly adjusting the overlap of sequentially following mat carriers is arranged between said mat carrier return means and said mat carrier feeding station.

4,372,900

METHOD OF FORMING REINFORCED FOAM STRUCTURE

Ralph G. Doerfling, Northville, Mich., assignor to Detroit Gasket & Mfg. Co., Detroit, Mich.

Filed Nov. 13, 1980, Ser. No. 206,496

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.3 **1 Claim**

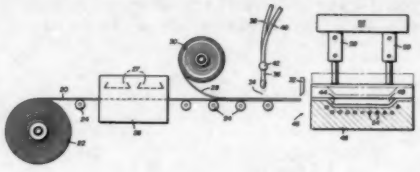
1. A method of forming a contoured fiberglass reinforced thermosetting foam laminate, comprising the steps of:

(a) laying a coherent mat of loosely woven glass fibers on a finish sheet wherein said finish sheet is a flexible woven sheet of absorbent fibers;

(b) spraying a liquid low density foamable thermosetting resin reaction mixture into said fiberglass mat, from opposite said mat, under sufficient pressure to fully penetrate said mat of glass fibers and wet said finish sheet, said finish sheet sufficiently pervious to adsorb said liquid resin;

(c) allowing said liquid thermosetting resin reaction mixture to foam and freely expand within said fiberglass mat for filling said mat and for temporarily bonding said finish sheet to said mat, and said thermosetting resin foam is an open cell relatively rigid polyurethane foam having a free blown density of less than about one pound per cubic foot; and

(d) immediately placing said thermosetting foam-fiberglass mat and finish sheet laminate in a contoured die, prior to the curing of said foam, and forming said laminate under



heat and pressure in said die into a permanently contoured shape and simultaneously permanently bonding said finish sheet to said contoured foam-fiberglass mat; and

(e) including heating said finish sheet prior to overlying said fiberglass mat on said finish sheet to prevent soaking of said finish sheet with said liquid thermosetting resin, thereby limiting blowing of said thermosetting resin foam through said finish sheet during foaming of said thermosetting resin reaction mixture.

4,372,901

PREFABRICATED PANEL CONSTRUCTION SYSTEM

Kwon S. Kim, Oklahoma City, Okla., assignor to Star Manufacturing Co., Oklahoma City, Okla.

Continuation of Ser. No. 40,971, May 21, 1979, abandoned, which is a division of Ser. No. 893,435, Apr. 4, 1978, Pat. No. 4,295,304. This application Feb. 3, 1981, Ser. No. 231,087

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.5 **3 Claims**

1. A method of making a prefabricated construction panel comprising the steps of:

(a) providing first and second sheets, at least one of said sheets having a plurality of elongated cavities formed by and between adjacent elongated corrugations formed in said one sheet, said cavities extending at least to one edge of said one sheet;

(b) arranging said first and second sheets in parallel spaced relation to each other;

(c) providing a plurality of elongated fastener receiving members, said fastener receiving members each comprising a continuous flat strip of metal having a length corresponding substantially to the length of said cavities and a width limited to that which will permit positioning said fastener receiving members in said cavities and against an inside surface of said one sheet;

(d) locating said fastener receiving members with respect to said one sheet by positioning one of fastener receiving members in selected ones of said cavities, respectively, against said inside surface for receiving, in use, screw threaded fastener members threaded into said panel in a selected position from the outside surface of said one sheet for securing said panel to a structural support; and

(e) securing said fastener receiving members within said

cavities by filling the space between said sheets with an insulating material, said insulating material, upon filling said space, serving to hold said fastener receiving members in said cavities and against said inside surface.

4,372,902

PREPARATION OF DENSE CERAMICS

Ivor E. Denton, Wantage, and John W. Heaney, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 159,626, Jun. 16, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 337,025
Claims priority, application Japan, Jun. 25, 1979, 54-22096
Int. Cl.³ C04B *35/56*
U.S. Cl. 264—65 **5 Claims**

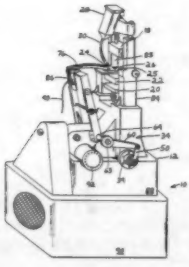
1. In a method of preparing a dense silicon carbide body by forming into a green body a mixture comprising silicon carbide powder having a surface area in the range from 3 m^2/g to 14 m^2/g and additionally a boron containing material and a carbonaceous material, and sintering the green body to produce the dense silicon carbide body, the improvement wherein the sintering is carried out in a methane-containing atmosphere, methane constituting less than 30% by volume of said atmosphere.

4,372,903

PROCESS FOR CONTROLLING THE MOVEMENT OF PRESS COMPONENTS

Steven L. Affolder, Berne, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 183,256, Sep. 2, 1980, Pat. No. 4,327,996. This application Sep. 21, 1981, Ser. No. 303,970
Int. Cl.³ B22F *3/02*
U.S. Cl. 264—109 **4 Claims**



1. A method for producing briquettes comprising the steps of loading a die cavity with loose powders through a reciprocable shoe, compressing the loose powders within the die cavity, ejecting a formed briquette from the die cavity, and coordinating the movements of said die cavity with the reciprocable shoe movement by coupling said shoe through a bell crank, crank arm member and rocker arms to a power shaft for adjusting the phase of shoe movement, range of shoe movement, and speed of movement with the opening and closing movements of the die by controlling the center of rotation of the crank arm member relative to the axis of rotation of the power shaft and further controlling the angular position of the bell crank operatively disposed between said power shaft and said crank arm member.

4,372,904

METHOD FOR MAKING AN EAR PLUG

Dennis L. Gunn, P.O. Box 738, Atlanta, Tex. 75551

Continuation of Ser. No. 813,009, Jul. 7, 1977, abandoned. This application Mar. 27, 1981, Ser. No. 248,562
Int. Cl.³ B29C *5/00, 17/10;* B29D *3/00*
U.S. Cl. 264—134 **1 Claim**

1. A method for forming an earplug for reduction of noise when worn by a user which method comprises the steps of:

(a) first placing a fibrous pellet in the ear canal of a user past the second bend and thereafter forming a plastic impression of the ear adjacent to the pellet, and wherein some excess plastic impression is formed which excess is partly shaped by the external ear and which reaches the outer end of the ear canal;

(b) trimming the plastic impression to form a generally flat face thereon which trimming removes the external ear portion of the impression;

(c) coating the trimmed impression with an external wax coating by dipping, and dipping the impression in a soapy liquid parting agent and thereafter permitting the impression to dry at room temperature and thereby harden on the outer surface;

(d) glueing the trimmed impression along with a plurality of similarly obtained impressions to a flask plate at the flat face thereon;

(e) placing a dam means around the flask plate and pouring a liquid which cures into a stonelike material over the flask plate to a depth sufficient to submerge and fully surround the plastic impression;

(f) agitating the flask plate and liquid to cause air bubbles to rise to the top of the liquid;

(g) curing the liquid to form a stonelike solid member;

(h) removing the flask plate from the solid member and thereafter removing the plastic impressions to leave investment cavities therein and trimming said investment to remove any sharp corners formed therein;

(i) coating the solid member and walls defining said investment cavities formed therein with a liquid mold release material to enhance subsequent mold release and permitting the liquid to dry;

(j) placing a liquid material which is capable of curing into a solid resilient material in the cavities including the steps of:

(1) making a first pour of liquid material;

(2) pressure packing the first pour of liquid material;

(3) making a second pour of liquid material after the first while the first pour is still liquid;

(4) pressure packing the second pour of liquid material;

(5) repeating steps (1) to (4) until the investment cavities are filled with uncured liquid material free of voids and bubbles;

(k) pressure curing the uncured liquid material at a temperature elevated sufficiently to obtain curing thereof into a resilient material;

(l) reducing the temperature to a level permitting access to the cured resilient earplug material;

(m) breaking the solid member across the cavity to remove the cured earplug; and

(n) coding the cured earplug to facilitate the identification of

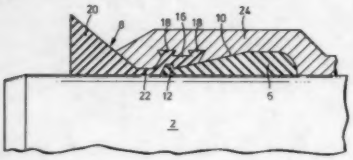
a left earplug from a right earplug using number or color coding.

4,372,905

METHOD OF FORMING A PIPE SOCKET

Nils-Erik Bohman, Forsheda, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Filed Dec. 30, 1980, Ser. No. 221,386
Claims priority, application Sweden, Jan. 14, 1980, 8000270
Int. Cl.³ B22D *11/126*; B29C *19/00*
U.S. Cl. 264—249 4 Claims



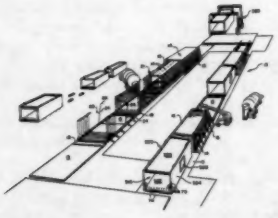
1. A method of forming a pipe socket having a sealing ring positioned at the inner surface of the wall of the pipe socket, said sealing ring having a fastening portion and a sealing portion connected therewith, the pipe wall being formed around a substantially cylindrical formed surface, characterized in that the sealing ring (**8**) is positioned around the form surface with the fastening portion (**16**) and the sealing portion (**20**) positioned axially adjacent each other, that the pipe wall (**24**) is formed around the form surface and the fastening portion of the sealing ring while leaving at least the main portion of the sealing portion outside the end of the pipe wall and that the sealing portion is folded against the inner side of the pipe wall after the pipe wall has been removed from the form surface with the fastening portion retained in the pipe wall.

4,372,906

METHOD AND APPARATUS FOR PRE-CASTING STEEL REINFORCED CONCRETE BOX-LIKE MODULES

Jaime L. del Valle, Rio Piedras, P.R., assignor to Master Modular Homes, Inc., Toa Baja, P.R.

Division of Ser. No. 942,377, Sep. 14, 1978, Pat. No. 4,272,050.
This application Jan. 8, 1981, Ser. No. 223,434
Int. Cl.³ B28B *21/60*; B29C *7/00*
U.S. Cl. 264—256 10 Claims



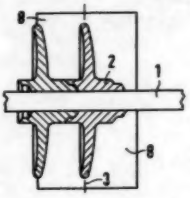
1. A method for forming, on a casting bed, a precast concrete box like building module of the type having a floor, a pair of spaced apart side walls extending up from said floor, and a roof extending between the upper ends of said side walls; said method comprising the steps of: (a) integrally casting simultaneously a concrete floor slab and the lower portions of the concrete side walls; (b) moving onto the floor slab after the concrete has at least partially cured a pair of interior forms each of which includes a vertical plate for defining the interior surface of one of said side walls and a horizontal plate at the upper end of the vertical plate for defining a portion only of the interior surface of said roof, each of said interior forms having been moved to bring its vertical plate into alignment with the interior surface of one of said lower portions of said side walls; (c) pouring the remainder of said concrete side walls and roof; (d) permitting the wall and roof concrete to cure sufficiently to render self-supporting a portion only of the roof concrete; (e) removing one of said interior forms to leave said portion only of the roof concrete unsupported; (f) shoring said unsupported portion of said roof concrete; and (g) then removing the other of said pair of interior forms from within said module, whereby said pair of interior forms has been removed from said module after a curing time less than the curing time required to render the entire roof self-supporting.

4,372,907

METHOD FOR MANUFACTURING PLASTIC ELECTRICAL INSULATORS

Georg Herold, Lichtenfels, and Hermann Kubs, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,351
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3003095
Int. Cl.³ B29D *31/00*
U.S. Cl. 264—265 4 Claims



1. A method for manufacturing a plastic electrical insulator for use outdoors, the electrical insulator having a fiberglass-reinforced plastic core rod, and an insulator disc surrounding the plastic core rod, the insulator disc being formed of an electrically insulating plastic molding compound, the method comprising the step of:

molding the insulator disc in a mold having a mold separation plane, an outer edge of the disc being situated near the mold separation plane; and

surrounding the insulation core rod with A multiply divided tool and a glider tool to form at least one further insulator disc, said further insulator disc being molded so as to partially overlap the previously molded insulator disc.

4,372,908

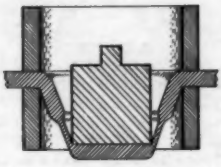
MANUFACTURE OF ARTICLES BY DRAWING

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Filed May 30, 1980, Ser. No. 155,126
Claims priority, application Sweden, Jun. 11, 1979, 7905046
Int. Cl.³ B29C *17/03*
U.S. Cl. 264—292 9 Claims

1. A process for the manufacture of an article from polyethylene terepthalate or similar materials comprising providing a substantially flat blank of amorphous, polyethylene terephthalate having a crystallinity of less than 10%, clamping said blank between clamping devices to form at least one inner zone completely surrounded by a closed, band-like, clamped section of material, applying a press element against said inner zone over a region smaller than the total area of said inner zone, whereby a second closed, band-like zone is formed between said clamped band-like section and said inner zone to which the press element is applied, relatively displacing said press

element and said clamping devices with the thermoplastic material at a temperature below the glass transition temperature (Tg) while maintaining said press element in contact with said inner zone, the second band-like zone being substantially greater than the thickness of the blank whereby the material in said second band-like zone is freely stretched by drawing in a drawing region between the outer surface of the press element and the inner surface of the clamping devices without contact of the drawn material with the surfaces of the clamping de-



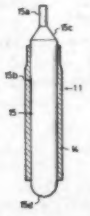
vices, the material in said drawing region forming a transition zone at which flow takes place in the material reducing the original thickness of the blank by a factor of about 3 to effect crystallization thereof and monoaxial orientation whereby a drawn element comprising a body with a wall of monoaxially oriented crystallized material is formed which element further comprises an edge part, and elongating said body in the axial direction by a number of repeated drawing steps to impart reduced dimensions at right angles thereto, the thickness of the drawn material being substantially unchanged.

4,372,909

METHOD OF PRODUCING A BOTTLE OF SATURATED POLYESTER RESIN

Yataro Yoshino; Akiho Ota, and Hiroaki Sugiura, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 82,698, Oct. 9, 1979. This application Mar. 19, 1981, Ser. No. 245,430
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—521 **2 Claims**



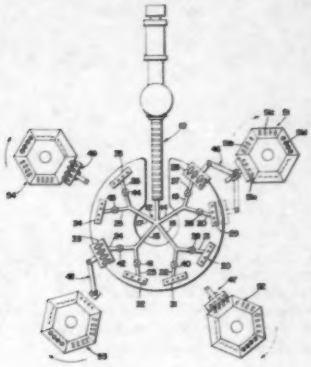
1. A method of producing a bottle of a saturated polyester resin by preparing a parison of a saturated polyester resin by an injection-molding process and by biaxially orienting said parison, comprising the steps of: molding said parison with both its ends open and having a mouth of relatively small diameter, a barrel of larger diameter and a tapered shoulder extending therebetween; heating only the mouth of said parison to an orientable temperature; orienting said mouth with a rod-shaped orienting jig which is extracted upward from the barrel to the mouth of said parison so that said mouth is oriented in the perpendicular direction to the axis of the parison, said rod-shaped orienting jig having a body, a shoulder formed on the upper end of the body and a head formed on the shoulder with a smaller diameter than that of the body; heating the barrel of said parison to a biaxially orientable temperature and blow-molding said parison in a mold.

4,372,910

METHOD FOR MOLDING HOLLOW PLASTIC ARTICLES

John F. Stroup, Cuyahoga Falls; Harold J. Robins, Cleveland, and Michael Teeple, Brunswick, all of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed Jun. 23, 1980, Ser. No. 162,179
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—532 **23 Claims**



1. A method of making hollow plastic articles from a thermoplastic resin material which comprises the steps of:

extruding plasticized resin in a hot stream;

directing the stream of resin sequentially into a plurality of preform molds disposed in at least two sets of molds having two or more molds in each set;

forming a preform in each mold;

transferring the preforms sequentially from each mold of each set of two or more molds to a single blowing apparatus before the preforms cool substantially, there being a separate blowing apparatus for each set of molds; and

blowing the preforms into plastic articles, the time interval between the forming of the preform and the blowing of the preform being substantially the same for all preforms.

4,372,911

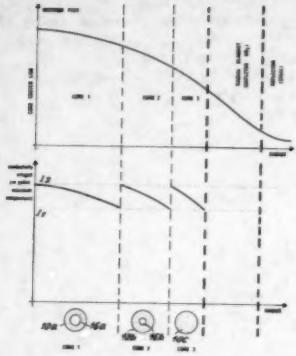
METHOD FOR FLATTENING THE CURVE OF EVOLUTION OF HEAT IN A FAST REACTOR CORE

Pierre C. Cachera, Saint-Germain en Laye, France, assignor to Electricite de France (Service National), Paris, France

Continuation-in-part of Ser. No. 843,652, Oct. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 656,603, Feb. 9, 1976, abandoned. This application May 21, 1980, Ser. No. 151,977
Claims priority, application France, Feb. 10, 1975, 75 04112
Int. Cl.³ G21C *3/16*
U.S. Cl. 376—349 **4 Claims**

1. A method for flattening the curve of evolution of heat of vertical fuel elements within the core of a liquid metal cooled fast neutron reactor having at least three core regions in which the density of neutron flux in the reactor conventionally decreases when going from the center of the core of the reactor toward its periphery in an axial direction and in a radial direction comprising the steps of forming said at least three core regions of hollow vertical fuel elements of constant enrichment and of the same outer diameter, of a material which is entirely in a solid state at the normal temperature of functioning of said reactor, forming each fuel element with an axial vertical canal

in the fissile part of the fuel element having a diameter in right section, disposing said elements in the core in such a way that the elements at the center of the core have a greater canal diameter than the elements disposed closer the radial periphery of the core, the diameter in right section of the axial canal of the fuel elements in each core region being different from the



diameters at the same height in all other core regions with this reduction in diameter being proportional to the reduction in neutron flux density so as to maintain the integral of conductivity at a substantially constant value, and providing for the fuel elements disposed at the same radial distance from the center of the core the same diameter of axial canal.

4,372,912

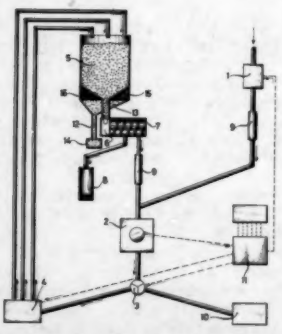
METHOD OF CONTROLLING THE REACTIVITY OF A GAS-COOLED CORE REACTOR

Claus-Benedict von der Decken, Kohnscheid; Hans-Jürgen Hantke, Ketsch, and Walter Stürmer, Mannheim, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 934,373, Aug. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,455, Oct. 14, 1976, abandoned, which is a continuation of Ser. No. 471,967, May 21, 1974, abandoned. This application Jul. 8, 1980, Ser. No. 167,432

Int. Cl.³ G21C *1/22*

U.S. Cl. 376—381 **1 Claim**



1. In a gas-cooled reactor of the pebble bed type:

pebble bed nuclear fuel comprised of numerous uniform spherical fuel units, each having a diameter of approximately six centimeters;

a container for containing the spherical fuel units in a three-dimensional pile, wherein the spherical fuel units define uniform spaces therebetween through which cooling gas circulates, the container having a ceiling reflector with opening means therethrough and a bottom having an opening means therethrough; and

a plurality of neutron-absorbing spheres of absorbing material for arresting nuclear reactions in the pile when the absorbing spheres are poured through the opening means in the top of the container and accumulate in the spaces between the fuel units; the absorbing spheres having a diameter no less than 0.93 centimeters and no greater than 2.50 centimeters.

4,372,913

POLYMERIZATION, AND CORROSION RESISTANCE, ENHANCEMENT BY ACID ADDITION SALTS OF METHACRYLIC ACID AND A 2-MONO (LOWER) ALKYLAMINOETHYL METHACRYLATE OR POLYMERS OF THESE SALTS

Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724

Continuation-in-part of Ser. No. 903,566, May 8, 1978, Pat. No. 4,212,782, which is a continuation of Ser. No. 674,990, Apr. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 413,043, Nov. 5, 1975, Pat. No. 3,950,398, which is a continuation-in-part of Ser. No. 15,935, Mar. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 488,756, Sep. 20, 1965, abandoned. This application Jul. 14, 1980, Ser. No. 168,015

Int. Cl.³ C23F *11/12, 11/14*

U.S. Cl. 422—16 **6 Claims**

1. A method for enhancing the corrosion resistance of iron or steel when contacted with water having a pH of about 2 to about 11, which method comprises dissolving in said water, in an amount effective for enhancing corrosion resistance, an agent selected from the group consisting of (a) an acid addition salt of methacrylic acid and a 2-mono(lower)alkylaminoethyl methacrylate said lower alkyl group being straight or branched chain, or cyclic, and having up to 6 carbons, the methacrylic acid and the 2-mono(lower)alkylaminoethyl methacrylate components being present in said salt in the ratio of from about 1 to about 1.5 moles of one per mole of the other and (b) a solid, free radical addition polymer of an acid addition salt of methacrylic acid and a 2-mono(lower)alkylaminoethyl methacrylate, said lower alkyl group being defined as above, wherein the methacrylic acid and the monoalkylaminoethyl methacrylate moieties are linked to one another by addition at the respectively original vinyl group of each of them and present in the ratio of about 1 mole to about 1.5 moles of one of them per mole of the other, and which polymer is insoluble in pentane at below its boiling point and in aqueous media manifests amphoteric activity.

4,372,914

BLOOD OXYGENATOR

Donald A. Raible, Santa Ana, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 689,971, May 26, 1976, Pat. No. 4,268,476, which is a continuation-in-part of Ser. No. 584,464, Jun. 6, 1975, abandoned. This application Apr. 27, 1981, Ser. No. 257,885

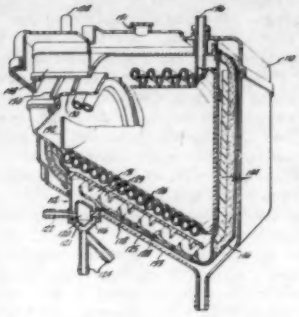
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—46 **3 Claims**

1. A bubble-type blood oxygenator having therein a bubble column having a first end and a second end, said bubble column being provided with a plurality of segments in end-to-end relationship, at least one of said segments having a serpentine passageway formed therein to promote secondary flow of blood bubbles passing therethrough, said passageway being

provided with a plurality of turns so that said blood bubbles are continuously rotated throughout their passage through said



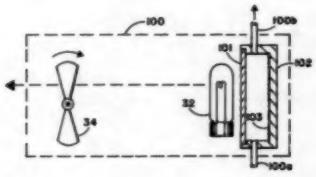
passageway, and a heat exchange conduit helically disposed in the bubble column of said oxygenator.

4,372,915

FLUORESCENT SULFUR DIOXIDE ANALYZER HAVING AN IMPROVED SULFUR DIOXIDE GENERATOR

Radhakrishna M. Neti, Brea, and Raymond E. Rocks, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 26, 1981, Ser. No. 277,458
Int. Cl.³ G01N *21/64;* B01J *7/00*
U.S. Cl. 422—91 **9 Claims**



1. In a fluorescent sulfur dioxide analyzer of the type having a fluorescence chamber and a detector for measuring fluorescent emissions from sulfur dioxide molecules in the fluorescence chamber, the improvement comprising:

(a) a sulfur dioxide generator including:

(i) means defining an enclosure having an inlet for connection to a source of an oxygen containing gas and an outlet;

(ii) means defining a sulfur deposit within the enclosure;

(iii) source means for producing ultraviolet radiation, said source means being arranged to illuminate the sulfur deposit while the oxygen containing gas flows thereover at a selected range of wavelengths to generate sulfur dioxide without also generating substantial amounts of ozone; and

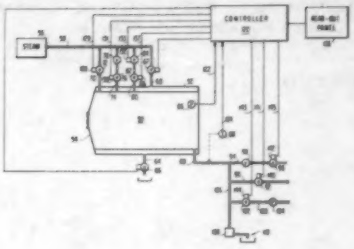
(b) means for connecting the sulfur dioxide generator in gas-supplying relationship to the fluorescence chamber.

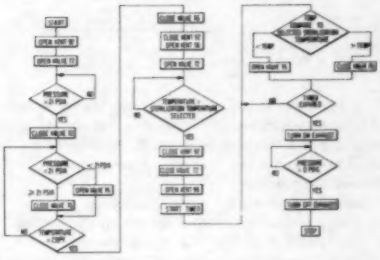
4,372,916

ESTABLISHING AND ASCERTAINING DESIRED AIR REMOVAL IN STEAM STERILIZATION

Robert E. Chamberlain, Erie, and Thomas G. Cook, Fairview, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 91,170, Nov. 6, 1979, Pat. No. 4,309,381.
This application Jun. 30, 1981, Ser. No. 279,209
Int. Cl.³ A61L *2/06;* G05B *1/00*
U.S. Cl. 422—111 **5 Claims**





1. Apparatus for steam sterilization of goods utilizing steam flow through a chamber to facilitate removal of air during a load conditioning phase and providing for determination of effective air removal by correlating measured chamber conditions with steam-table established data for the dependent variables of pressure and temperature for saturated steam, comprising

a sterilizing chamber capable of operating at pressures above atmospheric,

steam inlet conduit means including automatically controllable valve means,

chamber atmosphere vent conduit means including automatically controllable vent valve means having a substantially wide open configuration and a substantially closed configuration,

chamber pressure sensing means,

chamber temperature sensing means,

means providing for use of predetermined steam-table values for the dependent variables of pressure and temperature for saturated steam,

controller means for controlling injection of steam into the chamber and venting of chamber atmosphere from the chamber to hold one of such variables substantially level while measuring the remaining of such variables,

such controller means being responsive to such chamber pressure sensing means, such chamber temperature sensing means and such means providing for use of predetermined steam-table values to ensure that substantially all air has been removed during the load conditioning phase,

such chamber venting being carried out with such vent valve means in such substantially wide open configuration

during air removal from the chamber followed by rapidly pressurizing the chamber,

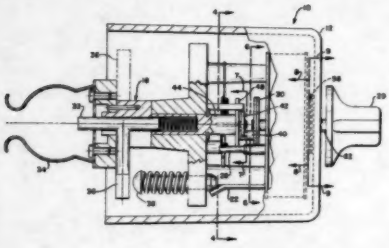
such chamber vent valve means being in its substantially closed configuration for carrying out a sterilization exposure phase, with such sterilization phase being followed by an exhaust phase which returns chamber pressure to substantially atmospheric pressure level.

4,372,917

CONTACT LENS STERILIZING APPARATUS

Harold M. Miller, Whitinsville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 5, 1981, Ser. No. 318,299
Int. Cl.³ A61L 3/00, 13/00
U.S. Cl. 422—116 6 Claims



1. In container inverting apparatus having a timer operated trip lever associated with container supporting and inverting means and a timer escapement locking lever for controlling apparatus timing out, said container supporting and inverting means comprising:

an axially rotatable flipper mechanism;

spring means biasing said flipper mechanism in one axially rotatable direction to a stop position;

means for approximately 180° oppositely rotatably setting said flipper mechanism against the bias of said spring,

means for cocking said flipper mechanism at said approximately 180° setting, said timer trip lever being associated with said cocking means for releasing said flipper member at end of timing out of said timer and permitting spring initiated return rotation to said stop position;

a container receiving clip on said flipper mechanism including therewithin means for initiating timing out of said timer by reception of said container, said 180° return rotation of said flipper for container inversion being effected at end of said timing out.

4,372,918

FLOW THROUGH PRESSURE REACTION APPARATUS

Verle W. Woods; Jay A. Woods, and Dale G. Woods, all of P.O. Box 1016, Yakima, Wash. 98901

Continuation-in-part of Ser. No. 960,952, Nov. 15, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,344
Int. Cl.³ B01J 19/00; E03B 5/00; G05B 9/05
U.S. Cl. 422—129 9 Claims

1. A flow-through pressure reaction apparatus, comprising:

an enclosed reaction chamber having first and second open ends;

a source of fluid;

first pump means having an inlet and a discharge;

fluid feed means operatively connected between the source of fluid and the inlet of said first pump means for directing a stream of fluid from said source to said first pump means in response to operation of said first pump means;

said first pump means having its discharge connected in closed fluid communication with said first open end of said reaction chamber for discharging the stream of fluid into said first open end at a first pressure head in response to operation of said first pump means;

second non-positive displacement pump means having an inlet and a discharge;

said second pump means having its discharge connected in closed fluid communication with said second open end of said reaction chamber for opposing movement of the stream of fluid within it by imparting to the fluid a second pressure head in response to operation of said second pump means, the value of said second pressure head being less than that of said first pressure head;

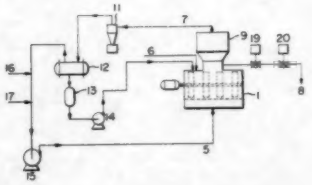
whereby simultaneous operation of said first and second pump means imparts flow to the stream of fluid from said first open end to said second open end of the reaction chamber due to the pressure head differential between said ends and such flow can be accommodated by passage of fluid through said second pump means.

4,372,919

VAPOR PHASE POLYMERIZATION APPARATUS FOR OLEFINS

Kunimichi Kubo, Tokyo; Mamoru Yoshikawa; Motokazu Watanabe, both of Kawasaki; Yasunosuke Miyazaki, Machida, and Mituji Miyoshi, Naka, all of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Mar. 10, 1981, Ser. No. 242,308
Claims priority, application Japan, Mar. 14, 1980, 55-31520; May 14, 1980, 55-62798
Int. Cl.³ B01J 12/02
U.S. Cl. 422—137 6 Claims

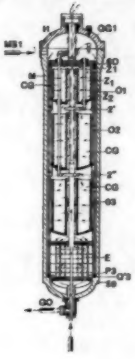


1. A vapor phase polymerization apparatus for olefins comprising a horizontal hollow cylindrical vessel having a lower curved surface formed by a perforated portion which is an arc of a circle defined by an angle of from 30 to 180 degrees from the center of said horizontal hollow cylindrical vessel, said perforated portion having a multiplicity of holes spaced at intervals in the range of from 0.5 to 50 mm; one or more agitator vanes mounted on a driving shaft, said driving shaft being centrally located in said vessel; an olefin feed chamber for feeding an olefin gas through said perforated portion, said olefin feed chamber being mounted so as to cover from below said perforated portion a gas flow velocity reducing chamber mounted at the top of said vessel; an unreacted olefin gas discharge port for discharging and recycling unreacted olefin gas through said olefin feed chamber; a polymerization catalyst inlet port; and a polymer outlet port, all said ports being provided in other portions than the curved perforated portion of said vessel.

4,372,920
AXIAL-RADIAL REACTOR FOR HETEROGENEOUS SYNTHESIS

Umberto Zardi, Lugano, Switzerland, assignor to Ammonia Casale S.A., Lugano, Switzerland, a part interest

Filed Jun. 24, 1980, Ser. No. 162,436
Claims priority, application Italy, Jul. 13, 1979, 24334 A/79; Jun. 11, 1980, 22701 A/80
Int. Cl.³ B01J 8/04; C01C 1/04
U.S. Cl. 422—148 23 Claims



1. A reactor for heterogeneous catalytic reactions of gaseous reactants under pressure, comprising:

a container having an inlet for introduction of said gaseous reactants and an outlet for the efflux of products of said reactions;

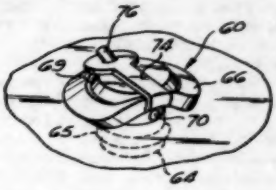
a cartridge having a cylindrically shaped wall placed within said container and communicating with said inlet and said outlet;

at least two stationary-bed, catalyst-containing baskets supported within said cartridge, each of said baskets including an imperforate bottom section, a cylindrical outer perforated wall, a cylindrical inner concentric perforated wall and an annular opening defined by said inner and outer perforated walls in the upper end of each stationary-bed, catalyst-containing basket, said opening formed in a plane approximately perpendicular to the longitudinal axis of said inner and outer perforated walls, said bottom section and said inner and outer perforated walls cooperating with said cylindrically shaped cartridge wall to form a partially restrictive axial flow means, whereby a portion of said gaseous reactants enters or departs and passes through said annular opening in each of said stationary-bed, catalyst-containing baskets substantially in the axial direction and the remainder of said gaseous reactants enters and passes through the cylindrical outer perforated wall of each of said catalyst-containing baskets substantially in the radial direction.

4,372,921
STERILIZED STORAGE CONTAINER

Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, 546 Tustin Ave., Newport Beach, Calif. 92660

Continuation of Ser. No. 115,678, Jan. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 895,239, Apr. 10, 1978, Pat. No. 4,247,517, which is a continuation-in-part of Ser. No. 821,042, Aug. 1, 1977, Pat. No. 4,251,842, which is a continuation-in-part of Ser. No. 734,228, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,044, Jul. 6, 1976, Pat. No. 4,196,160, which is a continuation-in-part of Ser. No. 640,824, Dec. 15, 1975, abandoned. This application Dec. 8, 1981, Ser. No. 328,701
Int. Cl.³ A61L 2/06, 2/26; B65D 51/16, 53/00
U.S. Cl. 422—300 9 Claims



1. Apparatus for containing items while being sterilized and stored comprising:

means forming a container including means providing access to the container interior;

support means holding said access means open;

means attached to said support means forming an expandable chamber positioned so that expansion of said chamber will move said support means to release said access means and permit it to close; and

a relief valve in said container for relieving a vacuum within said container to permit the access means to be opened, said relief valve including a filter therein arranged so that any air entering the container through the relief valve must pass through said filter;

said relief valve comprises a resilient member having a tubular plug which is inserted into a hole in said container and includes an outer flange secured to said plug and sealed against the outer surface of said container, said tubular plug having a passage open at one end into the interior of said container and open at its other end through a port in the side wall of the said tubular plug adjacent said flange providing communication with the exterior of the chamber when the valve flange adjacent said port is partially pulled away from the container.

4,372,922
PROCESS FOR THE RECOVERY OF INDIUM

Paolo Fossi, 52, avenue de Cressac - La Commanderie des Templiers, 78310 Elancourt, France, and Emilio Sambarino, Viale Gramsci 194, 88074 Crotone (CZ), Italy

Continuation of Ser. No. 74,506, Sep. 11, 1979, abandoned. This application Aug. 10, 1981, Ser. No. 291,837
Claims priority, application France, Sep. 11, 1978, 78 26027
Int. Cl.³ C01G 15/00
U.S. Cl. 423—112 22 Claims

1. Process for the selective recovery of indium from an aqueous sulfate solution of indium and other metals comprising at least zinc and iron, said indium being present in said aqueous sulfate solution as an impurity in a concentration of less than 1 gram per liter and in the III oxidation state, said aqueous sulfate solution having a hydrogen ion concentration between 0.01 and 5 N and a ferric iron concentration below 10 grams per liter, comprising the following successive stages:

(a) extracting said indium from said aqueous sulfate solution

by contacting said aqueous sulfate solution with a first stationary phase consisting of an inert substrate having a non-diluted diester of orthophosphoric acid as the active group bound thereto, whereby indium is extracted into said first stationary phase in proportionally greater quantities relative to the extraction of said other metals;

and

(b) eluting said indium from said first stationary phase by contacting said first phase with a second stripping phase comprising an acidic aqueous solution.

4,372,923

PURIFICATION OF SOLUTIONS OF GALLIUM VALUES BY LIQUID/LIQUID EXTRACTION

Jacques Helgorsky, Frepillon, and Alain Leveque, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 30, 1981, Ser. No. 326,178

Claims priority, application France, Dec. 5, 1980, 80 25831

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **13 Claims**

1. A process for the purification of an aqueous hydrochloric acid solution of gallium values by liquid/liquid extraction, comprising (i) liquid/liquid extracting an aqueous hydrochloric acid solution of gallium values with an organic phase which comprises a quaternary ammonium chloride extractant, (ii) separating the organic phase from the aqueous phase, (iii) selectively washing said organic phase by intimately contacting same with an aqueous solution of hydrochloric acid, whereby any remaining impurities are removed, (iv) next transferring the purified gallium values from said organic phase into an aqueous solution thereof, and (v) thence separating said organic phase from said resulting aqueous phase, whereby said aqueous phase comprises pure gallium chloride.

4,372,924

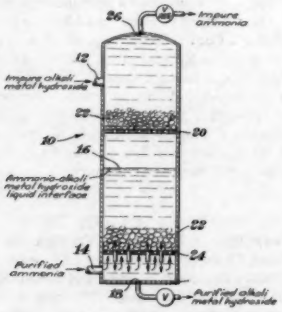
PURIFICATION OF ALKALI METAL HYDROXIDES

David L. Porter, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 27, 1980, Ser. No. 153,351

Int. Cl.³ C01D *1/04*

U.S. Cl. 423—179 **17 Claims**



1. In a method to purify in liquid phases, an impure alkali metal hydroxide by countercurrently contacting an aqueous solution of the hydroxide with ammonia in a container having a first inlet for the impure hydroxide solution upwardly disposed from a second inlet for the ammonia, a first outlet for the purified hydroxide solution and a second outlet for the ammonia containing impurities extracted from the impure hydroxide solution, the improvement comprising

(a) feeding an aqueous solution containing from about 40 to about 60 weight percent alkali metal hydroxide and at least a sodium chloride impurity into the first inlet;

(b) feeding sufficient ammonia into the second inlet to provide an ammonia to alkali metal hydroxide volume ratio of about 0.6 to 1 to about 1 to 1;

(c) countercurrently flowing the hydroxide and ammonia through a bed of a substantially inert, insoluble particulate material in the container; and

(d) controlling the temperature of the purified hydroxide solution in the lower portion of the container within a range of about 155° to about 170° F.

4,372,925

PROCESS FOR THE REMOVAL OF ACID GASES FROM GAS MIXTURES CONTAINING METHANE

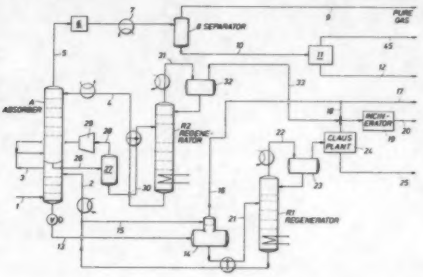
Roelof Cornelisse, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 25, 1981, Ser. No. 247,496

Claims priority, application Netherlands, Mar. 31, 1980, 8001886

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—226 **13 Claims**



1. A process for the treatment of a gas stream containing methane, light hydrocarbons, H_2S, and CO_2 comprising

(a) contacting said gas stream at superatmospheric pressure in a first absorption zone with a first absorbent mixture which is selective for H_2S, said first absorbent mixture comprising from 5 percent to 35 percent by weight of water, from 15 to 50 percent by weight of physical absorbent, and from 10 to 60 percent by weight of chemical absorbent, said chemical absorbent comprising one or more tertiary amines, under conditions effective to absorb H_2S, and absorbing H_2S and producing a gaseous stream containing methane, light hydrocarbons and CO_2, and a loaded absorbent solution;

(b) passing the loaded absorbent solution to a first regeneration zone, regenerating the loaded absorbent solution and producing H_2S and first absorbent mixture, and returning regenerated first absorbent mixture to the first absorption zone;

(c) contacting the gaseous stream from the first absorption zone in a second absorption zone at superatmospheric pressure with a second absorbent mixture which is selective for CO_2 and H_2S, said second absorbent mixture comprising from 5 to 35 percent by weight of water, from 15 to 50 percent by weight of physical absorbent, and from 10 to 60 percent by weight of chemical absorbent, said chemical absorbent comprising one or more primary or secondary amines, under conditions effective to absorb CO_2 and any H_2S remaining in the gaseous stream, and absorbing CO_2 and H_2S remaining in the gaseous stream and obtaining a sweet gas stream containing methane and light hydrocarbons, and a loaded second absorbent solution;

(d) passing the loaded second absorbent solution to a second regeneration zone, regenerating the loaded second absorbent solution and producing a CO_2 stream and second absorbent mixture, and returning regenerated second absorbent mixture to the second absorption zone; and

(e) separating water and light hydrocarbons from the sweet gas stream.

4,372,926

PROCESS FOR DESULFURIZATION, DEDUSTING AND DISCHARGE OF HOT FLY ASH-CONTAINING FLUE GAS

Klaus E. Gude, Vedb k; Karsten S. Felsvang, Allerod, both of Denmark, and Everett L. Coe, Downey, Calif., assignors to A/S Niro Atomizer, Soborg, Denmark and Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 22, 1981, Ser. No. 256,533
Claims priority, application Denmark, Jun. 30, 1980, 2820/80
Int. Cl.³ B01J 8/00; C01B 17/00
U.S. Cl. 423—244 8 Claims

1. A process for desulfurization of hot, fly ash-containing flue gas produced in a boiler plant by means of a combined spray drying-absorption step and removal of the material produced by the spray drying-absorption and the fly ash in a baghouse filter plant, in which process a reheating of the gas treated by spray drying-absorption takes place by mixing the treated gas with a stream of hot flue gas diverted to by-pass the spray drying-absorption step, said process comprising the steps of

(i) providing a first and a second stream of hot flue gas;

(ii) using the first stream of flue gas for preheating a flow selected from the group consisting of combustion air and feed water for the boiler plant, thereby cooling said first stream;

(iii) spraying an aqueous suspension of basic material into said first stream, whereby the water of the suspension evaporates resulting in a further cooling of the first stream to a temperature lower than the temperature required, if the stream should without admixture or reheating be discharged into the atmosphere after subsequent purification, and whereby a substantial portion of sulfur dioxide of the first stream is absorbed from a powder which contains reaction products of the absorption and unreacted basic material;

(iv) separating a partial stream from said first stream and combining said partial stream with said second stream of hot flue gas;

(v) passing the combined partial stream and second stream through a part of a fabric filter of a baghouse plant;

(vi) passing the remainder of said first stream through the remainder of the fabric filter of the baghouse plant; and

(vii) downstream of the fabric filter mixing said combined stream and said remainder of the first stream to form a mixed stream, and discharging the mixed stream into the atmosphere.

4,372,927

SULFUR OXIDES REMOVAL

Glenn R. McCullough, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 17, 1981, Ser. No. 293,893
Int. Cl.³ B01J 8/00; C01B 7/00; C01F 1/00
U.S. Cl. 423—244 19 Claims

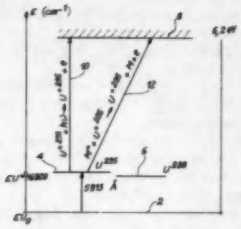
1. A process for the removal of sulfur oxides from a gaseous stream containing oxygen and water vapor comprising contacting the gaseous stream in a contact zone with a particulate mixture of a reactive calcium-containing material and activated carbon, the ratio of reactive calcium-containing material to activated carbon, on a weight basis, being from 100:1 to 0.1:1.

4,372,928

METHOD OF SEPARATING ISOTOPES FROM A GAS MIXTURE

Jean Chatelet, Rambouillet; Michel Clerc, Limours; Andre Coste, Paris, and Paul Rigny, Sceaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 828,616, Aug. 23, 1977, abandoned.
This application Dec. 20, 1979, Ser. No. 103,934
Claims priority, application France, Sep. 24, 1976, 76 28725
Int. Cl.³ B01D 59/00
U.S. Cl. 423—249 5 Claims



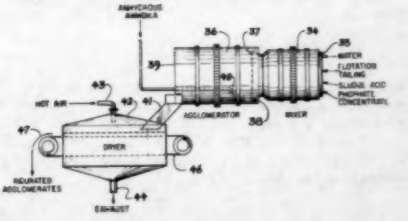
1. A method of separating isotopes from a gas mixture containing a number of isotopes of once ionized uranium, comprising the step of irradiating the mixture of once ionized uranium ions, with laser light made up of photons having an energy which resonates with an excitation level of a given isotope of the gas mixture, introducing simultaneously metastable atoms or molecules into the same mixture, the metastable atoms or molecules having an excitation energy which is less than the energy for a further ionization of the constituents of the mixture and greater than the energy gap between the energy for a further ionization of the given isotope excited by the laser light and the energy of the excitation level of the same isotope, the separation of the given isotope resulting from the further ionization of the excited isotope by metastable atoms or molecules, this further ionization being a Penning ionization.

4,372,929

ENERGY CONSERVATION AND POLLUTION ABATEMENT AT PHOSPHORUS FURNACES

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Filed Jan. 7, 1981, Ser. No. 223,122
Int. Cl.³ C01B 25/01
U.S. Cl. 423—323 13 Claims



1. A process for smelting phosphate ore at phosphorus furnaces comprising the steps of:

(a) mixing minus ¼-inch phosphate ore with a mineral acid, an alkaline fluid, and water;

(b) tumbling the mixture in a rotating cylinder to form agglomerates of the desired size;

(c) indurating the agglomerates in a hardening heat range;

(d) removing the minus 6-mesh fines from the agglomerates;

(e) recycling fines from step (d) to step (b);
(f) removing minus 6-mesh fines from reducing carbon;
(g) mixing the reducing carbon fines from step (f) with a mineral acid, an alkaline fluid, and water;
(h) tumbling mixture from step (g) in a horizontal rotating cylinder;
(i) indurating agglomerates from step (h) by heating in the temperature range of 200° to 280° F.;
(j) adjusting and maintaining the quantities of liquid phase in the steps of agglomerating reducing carbon fines and phosphate ore to prepare reducing carbon and phosphate ore agglomerates of the same average particle size and particle size distribution;
(k) preparing a proportioned charge mixture comprised of lump silica rock, onsize reducing carbon, agglomerated reducing carbon fines from step (i), and agglomerated phosphate ore from step (c);
(l) smelting the proportioned charge mixture from step (k) in a conventional electric phosphorus furnace to produce elemental phosphorus.

7. A process for smelting phosphate ore at phosphorus furnaces comprising the steps of:
(a) mixing minus ¼-inch phosphate ore with phosphoric acid in a rotating cylindrical mixer;
(b) discharging the mixture from step (a) into a rotating cylinder;
(c) adding ammonia to the rotating cylinder;
(d) tumbling said mixture to form agglomerates;
(e) indurating agglomerates from step (d) by heating
(f) preparing a proportioned furnace charge mixture comprised of agglomerated phosphate ore from step (e), reducing carbon, and flux;
(g) smelting the charge mixture from step (f) in a conventional phosphorus furnace;
(h) volatilizing ammonia from the phosphorus furnace;
(i) treating furnace gases in an electrostatic precipitator, adiabatic condenser, and gas exhauster as in a conventional condensing system;
(j) collecting water and condensed liquid phosphorus;
(k) neutralizing acidic particulates with volatilized ammonia;
(l) neutralizing acids in condenser water with volatilized ammonia.

4,372,930
ZEOLITE NU-3

Glyn D. Short, Yarm, and Thomas V. Whittam, Darlington, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 5, 1981, Ser. No. 260,839
Claims priority, application United Kingdom, May 13, 1980, 8015890
Int. Cl.³ C01B *33/20, 33/28*
U.S. Cl. 423—326 **17 Claims**

1. Zeolite Nu-3 having a molar composition expressed by the formula:

$$0.5 \text{ to } 1.5\ R_2O{:}Y_2O_3{:}\text{at least } 5\ XO_2{:}0 \text{ to } 400\ H_2O$$

wherein R is a monovalent cation or l/n of a cation of valency n where n is a whole number of 2 or more, X is silicon and/or germanium, Y is one or more of aluminium, iron or gallium and H_2O is water of hydration additional to water notionally present when R is H, and having an X-ray diffraction pattern substantially as shown in Table 1.

4,372,931
MICROCRYSTALLINE SYNTHETIC FAUJASITE

William J. Ambs, Swarthmore, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 154,697, May 30, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,457
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—329 **11 Claims**

1. The method of obtaining synthetic faujasite in microcrystalline form which comprises mixing an aqueous alkali metal silicate solution with an aqueous alkali metal aluminate solution, at a temperature from below about 10° C. to short of freezing and in proportions of alkali metal silicate and alkali metal aluminate such as to furnish a SiO_2/Al_2O_3 mole ratio in the reaction mixture in the range of from 4 to 10 and to obtain a faujasite structure, adding an additive selected from the group consisting of solid mono- and disaccharides and mixtures thereof in an amount of 1.5 to 5% by weight of the total reaction mixture, initially aging the reaction mixture for 6 to 24 hours at 5° to 50° C. followed by subjecting the aged mixture to increased temperatures in the range of about 25° to 120° C. and above the initial aging temperatures for 2 to 24 hours; thereafter separating the formed microcrystals from the mother liquor.

4,372,932
PROCESS FOR REMOVING SO_x AND NO_x COMPOUNDS FROM GAS STREAMS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 907,189, May 18, 1978, Pat. No. 4,222,991. This application May 21, 1980, Ser. No. 151,783
The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.
Int. Cl.³ B01D *53/36;* C01B *21/02*
U.S. Cl. 423—351 **46 Claims**

1. A process for treating a feed aqueous solution containing one or more nitrogen components selected from the group consisting of nitrite anions and nitrate anions, which process comprises (1) contacting, in the presence of formate ion, said feed aqueous solution with a water insoluble, solid substance containing a tertiary amine functional group under conditions, including an elevated temperature, such that a substantial proportion of said nitrogen components are converted to elemental nitrogen and (2) separating said nitrogen from a product aqueous solution of reduced dissolved nitrogen components content.

4,372,933
PRODUCTION OF ISOCYANIC ACID

Jai H. Kyung, Dublin, and Joseph G. Holehouse, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 29, 1982, Ser. No. 373,085
Int. Cl.³ C01C *3/00, 3/14*
U.S. Cl. 423—365 **7 Claims**

1. A process for preparing isocyanic acid which comprises reacting a mixture of nitric oxide, carbon monoxide and hydrogen at a temperature of from about 200° to 400° C. in the presence of iridium or rhodium metal catalyst supported on a particulate carrier selected from the group consisting of silica, γ-alumina, zirconium oxide and silicon carbide, said carrier further characterized in having a surface area, expressed as M^2/g, of not in excess of one, the contact time between said mixture and said catalyst being less than 1 second.

4,372,934
PRODUCTION OF ISOCYANIC ACID

Jai H. Kyung, Dublin, and Phyllis L. Brusky, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 7, 1982, Ser. No. 385,422
Int. Cl.³ C01C *3/00, 3/14*
U.S. Cl. 423—365 **8 Claims**

1. A process for preparing isocyanic acid which comprises reacting a mixture of nitric oxide, carbon monoxide and hydrogen at a temperature of from about 200° to 400° C. in the presence of a doped iridium or rhodium metal catalyst supported on a particulate carrier selected from the group consisting of silica, γ-alumina, zirconium oxide and silica carbide, said carrier further characterized in having a surface area, expressed as m^2/g, of not in excess of one, and wherein said

dopant is selected from the group consisting of Ni, Zn, Cu, Co, Cr, Fe, Cd and Ag metal with the dopant metal present to the extent of 0.1–2 mol % based on said metal catalyst.

4,372,935

NO_x REMOVAL FROM NO_x/O_2 GASEOUS FEEDSTREAMS

Roger Botton, Lyons, and Dominique Cosserat, Saint Priest, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 30, 1981, Ser. No. 279,000
Claims priority, application France, Jul. 11, 1980, 80 15461
Int. Cl.³ C01B 21/40
U.S. Cl. 423—393 21 Claims

1. In a process for the removal of nitric oxide, NO, and nitrogen peroxide, NO_2, from gaseous admixtures comprising the same, together with gaseous oxygen, by countercurrently oxidizing/absorbing said gaseous feedstream in aqueous solution, in a gas/liquid phase contactor, and wherein that section of said phase contactor the NO_x content in the gaseous feedstream is less than 6000 vpm, the improvement which comprises that the residence time in said less than 6000 vpm section of said phase contactor, is increased to a value such that the ratio K, of the liquid retention volume in cubic meters in said phase contactor to the rate of flow therein of said gaseous feedstream in Nm^3/hour, in excess of $5 \cdot 10^{-4}$ hour.

4,372,936

PROCESS FOR PRODUCING CARBON BLACK

Vitaly F. Surovikin, ulitsa Lermontova, 20, kv. 80; Alexandr R. Rogov, ulitsa Volochaevskaya, 15-e, kv. 24; Gennady V. Sazhin, ulitsa 50-letia Komsomola, 8, kv. 33, and Georgy L. Gorjunov, ulitsa Truda, 10, kv. 82, all of Omsk, U.S.S.R.

Filed Aug. 29, 1979, Ser. No. 70,791
Int. Cl.³ C01B 31/02; C09C 1/48
U.S. Cl. 423—450 8 Claims

1. A process for producing carbon black, comprising:
combusting a first fuel with air to form a high temperature stream of products of complete combustion of the fuel;
introducing a hydrocarbon feedstock into said high temperature product stream, said temperature being sufficient to cause thermal decomposition of the hydrocarbon feedstock and the formation of a hot carbon black containing effluent;
recycling about 2 to 26 volume % of the hot carbon black containing effluent, without cooling, to the combustion step as a second fuel to completely replace the first fuel, wherein the the heat of the second fuel is utilized to decompose the hydrocarbon feedstock, and whereby the total yield of carbon black is increased;
introducing a cooling agent into the remaining carbon black effluent product stream, and recovering the carbon black product.

4,372,937

WASTE HEAT RECOVERY

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 141,502, Apr. 18, 1980, Pat. No. 4,296,800. This application Aug. 11, 1981, Ser. No. 292,103
Int. Cl.³ C01B 31/02; C09C 1/48
U.S. Cl. 423—454 6 Claims

1. A process for producing carbon black by pyrolysis of a feed hydrocarbon wherein a gas stream containing carbon black is passed through a means defining a flow path of an indirect heat exchanger, said process comprising preventing the substantial build up of carbon black deposits or cleaning carbon black deposits or both from said means defining a flow path by
(a) providing a fixed bed of fluidizable particulate solids within said indirect heat exchanger,
(b) positioning a shell-tube heat exchange section having a plurality of tubes within said bed of solids in such a manner that said bed of solids extends from below the inlet, through, and above the outlet of the tubes with the heat exchange fluid passing through the shell side and with said gas stream containing carbon black passing through the tubes which contain said particulate solids whereby heat is transferred from the gas stream containing the carbon black to the fluidized particulate solids and by way of the tubes to the shell fluid, said tubes being so sized as to have a length to diameter ratio sufficient to allow both upwardly and downwardly movement of said particulate solids within said tubes,
(c) passing said gas containing carbon black through said bed of solids under conditions which cool said gas and fluidize said bed to maintain the inner peripheries of the tubes substantially freed from carbon black deposits to allow efficient heat exchange, and (d) withdrawing said cooled gas through a gas-solids separator positioned above said bed of solids within the cooling zone to prevent particulate solids from escaping with the cooled gas by recovering same and returning recovered entrained particulate solids to said fixed bed.

4,372,938

PRODUCING SULFUR TETRAFLUORIDE USING AMINE/HYDROGEN FLUORIDE COMPLEX

Yoshio Oda; Hiroshi Otouma, both of Yokohama; Keiichi Uchida, Kawasaki; Shinsuke Morikawa, Yokohama, and Masaaki Ikemura, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 196,655, Oct. 14, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,670
Claims priority, application Japan, Oct. 12, 1979, 54-130833; Aug. 1, 1980, 55-105115; Aug. 12, 1980, 55-109808
Int. Cl.³ C01B 17/45; C10B 17/00
U.S. Cl. 423—469 10 Claims

1. A process for producing sulfur tetrafluoride which comprises reacting in the absence or presence of a solvent an amine/hydrogen fluoride complex having the formula:

$$Am.(HF)_n$$

wherein Am represents an amine selected from the group consisting of nitrogen-containing heterocyclic aromatic amines and derivatives thereof, and n represents 2–4, with sulfur dichloride, sulfur monochloride or a combination of chlorine and sulfur at a temperature of 0° to 60° C., the molar ratio of said amine/hydrogen fluoride complex to said sulfur dichloride, sulfur monochloride or sulfur being represented by the formula:

$$\frac{B}{n \times A} > 0.5$$

wherein n is as defined above, A represents moles of sulfur in said sulfur dichloride, sulfur monochloride or sulfur, and B represents moles of said amine/hydrogen fluoride complex.

4,372,939

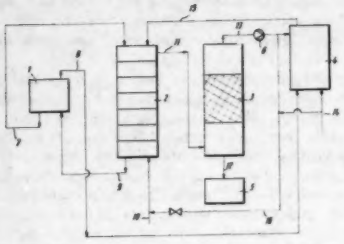
PROCESS OF PRODUCING CHLORINE DIOXIDE

Siegfried Bielz, Frankfurt am Main; Paul Janisch, Steinau, and Karl Lohrberg, Heusenstamm, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 142,909, Apr. 23, 1980, abandoned. This application Jun. 12, 1981, Ser. No. 272,856
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917132
Int. Cl.³ C01B 11/02
U.S. Cl. 423—478 13 Claims

1. In the continuous production of chlorine dioxide containing gases wherein an alkali metal chlorate solution is reacted

with hydrochloric acid in a reactor through which an air stream is passed countercurrent to the alkali metal chlorate solution, the chlorine dioxide is removed from said gases and virtually chlorine dioxide free gases are at least partially burned in the presence of hydrogen to form HCl and there are discharged from the reactor chlorine dioxide and alkali metal



chloride solution, the improvement which comprises adding chlorine gas to the air stream in an amount of at least 18 volume percent, said amount of chlorine also being at least equal to that in which chlorine is discharged from the reactor in the form of chlorine dioxide, thereby permitting the overall efficiency of the process to be increased at a given content of chlorine dioxide in the gas discharged from the reactor.

4,372,940

PROCESS AND APPARATUS FOR TREATMENT OF THIOSULFATE CONTAINING LIQUORS

Bruce L. Brandenburg, Wausau, and Gerald L. Bauer, Rothschild, both of Wis., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,860
Int. Cl.³ C01B *17/02*
U.S. Cl. 423—567 A **14 Claims**

1. A process for treating thiosulfate containing liquors by wet oxidation, comprising the steps of:

a. subjecting said thiosulfate containing liquors to a first wet oxidation step at a temperature sufficient to oxidize a portion of said thiosulfate to sulfuric acid and sulfate and to decompose remaining thiosulfate to sulfite and elemental sulfur;

b. concentrating and removing said elemental sulfur from the wet oxidized liquors of step (a); and

c. subjecting the wet oxidized liquors from step (b) to a second wet oxidation step at a temperature sufficient to achieve substantial destruction of sulfur, organic matter and other oxidizable substances in said liquors.

4,372,941

NOVEL RADIOASSAY PROCEDURE

James W. Ryan, 3420 Poinciana Ave., Dade County, Miami, Fla. 33133

Filed Sep. 5, 1980, Ser. No. 184,653
Int. Cl.³ A61K *43/00*
U.S. Cl. 424—1 **23 Claims**

1. A method for the detection of enzymic activity in biological material by an assay procedure comprising the steps of:

mixing a radiolabelled substrate for the enzyme with the biological material in a vial of no more than 20 ml. volume under conditions where the enzyme to be detected is catalytically active if present in the substrate,

incubating the biological material—substrate mixture in said vial to permit the enzyme if present to catalyze the hydrolysis of the substrate,

stopping the hydrolysis by adding to said vial an agent effective for that purpose,

mixing in said vial the incubated material containing the hydrolyzed substrate from the preceding step with at least one organic solvent for a radiolabelled hydrolysis remnant product of the substrate that does not dissolve the substrate which also contains a scintillant in sufficient quantity to permit measurement,

permitting the mixture in said vial to separate on its own, without centrifugation into an aqueous phase containing unreacted substrate and an organic phase containing radiolabelled remnant product, and

measuring the radioactivity of the radiolabelled remnant product in the organic phase.

4,372,942

CANDY BASE AND LIQUID CENTER HARD CANDY MADE THEREFROM

Paul A. Cimiluca, Succasunna, N.J., assignor to Beecham Inc., Clifton, N.J.

Filed Aug. 13, 1981, Ser. No. 292,482
Int. Cl.³ A23G *9/00*; A61K *27/00*
U.S. Cl. 424—16 **16 Claims**

1. A candy base which comprises, before cooking, from about 35 to about 60%, by weight, sucrose, from about 55 to about 35%, by weight, corn syrup and from about 1 to about 10% by weight of a fluidizing agent selected from the group consisting of mannitol and a mixture of mannitol and sorbitol having a weight ratio of mannitol to sorbitol of at least about 1:1.

4,372,943

NOVEL PESTICIDAL FORMULATION

Steven C. Papanu, and Ralston Curtis, both of Los Altos, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 228,419, Jan. 26, 1981, abandoned. This application Nov. 30, 1981, Ser. No. 325,955
Int. Cl.³ A61K *31/74*; A01N *25/22, 37/34*
U.S. Cl. 424—78 **10 Claims**

1. A stable pesticidal oil-in-water concentrate free from thickeners and consisting essentially of:

(a) 1 to 50% by weight of α-cyano-3-phenoxybenzyl 2-(2-chloro-4-trifluoromethylphenylamino)-3-methylbutanoate dispersed as particles having an average size less than 1 micron;

(b) 2 to 20% by weight of polyvinyl alcohol having a molecular weight of from 2,000 to 125,000 and having from 11 to 28% of its hydroxy groups present as the acetate ester;

(c) the balance being water; and

the emulsion being freeze-thaw stable, 50 degrees Centigrade storage stable and water dispersable.

4,372,944

COSMETIC CREAM FORMULATION

Anne M. Herrold, Brownsburg, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1981, Ser. No. 289,653
Int. Cl.³ A61K *31/745, 47/00*
U.S. Cl. 424—83 **1 Claim**

1. A cosmetic cream formulation consisting essentially of, in percent by weight:

Ingredients	Percent
white beeswax	2.00
distilled lanolin alcohols	0.50
white petrolatum	2.00
triglyceryl diisostearate	5.50
squalane (2,6,10,15,19,23-hexamethyl-tetracosane)	5.00
light mineral oil	6.00
isopropyl myristate	5.00
polyethylene homopolymer (1500 m. wt., density 0.91 g/cc)	3.00
polydimethylcyclosiloxane	3.00
quaternary bentonite (Bentone. No. 38)	0.40

-continued

Ingredients	Percent
70% sorbitol solution	5.00
glyoxyldiureide	0.50
preservative	q.s.
deionized water	q.s. to 100%

4,372,945

ANTIGEN COMPOUNDS

Vilas V. Likhite, 317 Marlborough St., Boston, Mass. 02116

Continuation of Ser. No. 93,171, Nov. 13, 1979, Pat. No. 4,285,930, which is a continuation of Ser. No. 858,847, Nov. 7, 1977, abandoned. This application Aug. 3, 1981, Ser. No. 289,138

Int. Cl.³ A61K *39/10, 39/00*

U.S. Cl. 424—92 **4 Claims**

1. An antigen compound useful in the production of an antigen conjugate compound for producing relatively large titers of antibodies specific thereto, which compound comprises a killed strain of *B. pertussis* mutant strain NRRL B-11, 232 coupled to one reactive NCO site of a diisocyanate-coupling agent leaving the other reactive NCO site adapted to be coupled to another antigen.

4,372,946

CLAVULANIC ACID DERIVATIVES THEIR PREPARATION AND USE

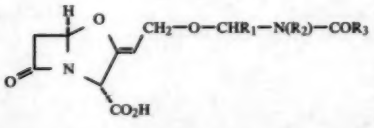
Thomas T. Howarth, Reigate, and Eric Hunt, Betchworth, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 942,348, Sep. 14, 1978, Pat. No. 4,244,965. This application Jul. 9, 1980, Ser. No. 167,378

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 **84 Claims**

43. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically effective amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or pharmaceutically acceptable ester thereof wherein R_3 is joined to R_1 to form a 4-, 5- or 6-membered ring or is joined to R_2 to form a 5- or 6-membered ring wherein R_1 is hydrogen or lower alkyl and R_2 and R_3 are hydrogen, lower alkyl or lower alkyl substituted by lower alkoxy, aryloxy, carboxylic acid or a pharmaceutically acceptable salt or lower alkyl or aralkyl ester thereof, or by amino or aryl with the proviso that when R_2 is hydrogen, R_1 is not hydrogen and R_1 and R_3 are not joined to form a group of the sub-formula (a):

wherein R_4 is hydrogen or NH.CO.R_5 wherein R_5 is lower alkyl, lower alkoxy, lower alkyl, aryl, aralkyl, aryloxyalkyl, lower alkoxy or aryloxy, and an antibacterially effective amount of amoxycillin or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,372,947

ANTIBIOTIC SAFRAMYCIN S AND PROCESS FOR PRODUCING THE SAME

Tadashi Arai, 6-50-6, Nogata, Nakano-ku, Tokyo, Japan; Katsuhiro Takahashi, Tokyo, Japan; Kimiko Ishiguro, Kamagaya, Japan, and Koji Yokoyama, Chiba, Japan, assignors to Tadashi Arai, Tokyo, Japan

Filed Sep. 23, 1980, Ser. No. 189,756

Claims priority, application Japan, Mar. 26, 1980, 55-38403

Int. Cl.³ A61K *35/00;* **C07D** *521/00;* **C12P** *1/06*

U.S. Cl. 424—121 **2 Claims**

1. An antibiotic substance, saframycin S, having the following physico-chemical characteristics:

color and appearance:

dark yellow powder;

melting point:

107°–115° C.;

specific rotation:

$[\alpha]_D^{25} = +32.5$ (0.5 methanol);

elementary analysis:

C: 61.09%, H: 6.67%, N: 7.49%

C: 61.45%, H: 6.18%, N: 7.48%

molecular weight:

553;

empirical formula:

$C_{28}H_{30}N_3O_8^+ \cdot OH^-$

ultraviolet absorption spectrum as shown in FIG. 1:

UV λ_{max}^{MeOH} nm (log ε): 268 (4.21)

UV λ_{mik}^{MeOH} nm (log ε): 234 (3.92);

infrared absorption spectrum as shown in FIG. 2:

IR $_{max}^{CHCl_3}$ cm^{-1}: 3400, 1720, 1680, 1650

NMR spectrum (C_6D_5N) as shown in FIG. 3:

δ: 1.88 (3H, s), 2.30 (3H, s),
2.48 (3H, s), 2.72 (3H, s),
3.82 (3H, s), 3.85 (3H, s),
5.46 (1H, s).

or a pharmaceutically acceptable acid addition salt thereof.

4,372,948

DERIVATIVE OF SACCHARIDE AND PHYSIOLOGICALLY ACTIVE AGENT CONTAINING THE SAME

Chikao Yoshikumi, Kunitachi; Fumio Hirose, Tokyo; Yoshio Ohmura, Funabashi; Takayoshi Fujii, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Tokyo; Takao Ando, Tokyo, and Minoru Ohhara, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

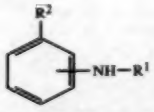
Filed Mar. 25, 1981, Ser. No. 247,521

Claims priority, application Japan, Apr. 11, 1980, 55-47654

Int. Cl.³ A61K *31/70;* **C08B** *37/00*

U.S. Cl. 424—180 **36 Claims**

1. Derivatives of a saccharide, represented by the general formula (I)



(I)

wherein R^1 represents a residual group formed by removing one hydroxyl group from the reducing end of a monosaccharide, disaccharide or trisaccharide; R^2 represents

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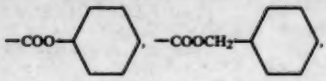


$-CONH_2$ or $-CH_2COOR^3$ and R^3 represents a hydrogen atom, an alkyl of one to four carbon atoms or an equivalent of pharmaceutically acceptable metal.

4,372,949

TREATMENT OF CANCER WITH CARCINOSTATIC AND IMMUNOSTIMULATING AGENT CONTAINING LYSOPHOSPHOLIPID AND PHOSPHOLIPID

Yutaka Kodama; Kaoru Oyama, both of Toyama; Ryusaku Shimizu, Nanao; Masao Nakabayashi, Namekawa; Yoshifumi Nakashima, Himi; Takashi Sano; Masaaki Shibata, both of Toyama, and Kiyoshi Goden, Takaoka, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 29, 1980, Ser. No. 125,800

Claims priority, application Japan, Mar. 5, 1979, 54/24600; Sep. 14, 1979, 54-117262

Int. Cl.³ A61K *31/685, 45/05*

U.S. Cl. 424—199 **9 Claims**

1. A method for treating a host mammal having cancer, which comprises administering to said host mammal a therapeutically effective amount of a composition comprising a lysophospholipid and a phospholipid in an amount of 1 part by weight of lysophospholidpid to from 1.0–500 parts by weight of phospholipid.

2. The method according to claim 1, wherein the composition is in the form of lipid vesicles.

4,372,950

Patent Not Issued For This Number

4,372,951

VAGINAL DELIVERY FOR PHYSIOLOGIC FOLLICULAR-LUTEAL STEROID TREATMENT

Nichols Vorys, 1450 Hawthorne Ave., Columbus, Ohio 43203

Continuation-in-part of Ser. No. 83,636, Oct. 11, 1979, Pat. No. 4,291,028, which is a continuation of Ser. No. 865,851, Dec. 30, 1977, abandoned. This application Jul. 21, 1981, Ser. No. 285,590

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—239 **15 Claims**

1. A method of regulation of the menstrual cycle in which effective dosages of pharmacologically active steroid compositions selected from the group of estrogenic active steroids and progestational active steroids are administered in a temporal succession in a correspondence with a first follicular phase and a following luteal phase in an approximately 28 day menstrual cycle, in which, dosage of the follicular phase is dependent upon the presenting endogenous estrogen characteristic of the patient, and the luteal phase includes:

a vaginal delivery system which provides effective concurrent dosages of (1) a pharmacologically active steroid selected from the group of estrogen active steroids and (2) a pharmacologically active steroid selected from the group of progestational active steroids, administered together, for a finite period of time of approximately 14 days during the luteal phase of the drug administration cycle, whereby predictable physiologic levels of activity of each steroid administered are provided during the luteal phase of the drug administration cycle.

4,372,952

CEPHEM COMPOUNDS

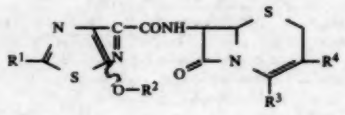
Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, Higashinari, and Kiyoshi Tsuji, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 59,893, Jul. 23, 1979, Pat. No. 4,284,631. This application Apr. 10, 1981, Ser. No. 253,026

Int. Cl.³ C07D *501/22*; A61K *31/545*

U.S. Cl. 424—246 **11 Claims**

1. A compound of the formula:



(I)

wherein

R^1 is amino or protected amino,

R^2 is lower alkyl of from one to six carbon atoms substituted with aryl hydrocarbon of from 6 to 10 carbon atoms or substituted aryl hydrocarbon with at least one halogen, hydroxy, amino (lower) alkyl, amido (lower) alkyl, or lower alkyl substituent,

R^3 is carboxy or protected carboxy, and

R^4 is hydrogen,

and its pharmaceutically acceptable salt.

4,372,953

TETRAZOLE DERIVATIVES, AND ANTI-ULCER COMPOSITION CONTAINING THE SAME

Minoru Uchida, Komatsujima; Takao Nishi, and Kazuyuki Nakagawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

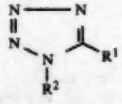
Filed Feb. 27, 1981, Ser. No. 239,044

Claims priority, application Japan, Feb. 29, 1980, 55-25521; Mar. 1, 1980, 55-25707; Mar. 1, 1980, 55-25708; Mar. 3, 1980, 55-27084; Sep. 16, 1980, 55-128160; Sep. 30, 1980, 55-136902; Oct. 6, 1980, 55-140051

Int. Cl.³ A61K *31/41, 31/44, 31/445, 31/505*; C07D *257/04, 401/12, 401/14, 401/06*

U.S. Cl. 424—248.5 **24 Claims**

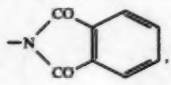
1. A tetrazole derivative of the formula:



wherein R^1 is a lower alkyl, phenyl or a group of the formula: $-S(O)_l-A-(X)_m-R^3$, and R^2 is hydrogen, a lower alkyl, phenyl or a cycloalkyl when R^1 is the group $-S(O)_l-A-(X-)_m-R^3$, or R^2 is a group of the formula: $-B-CO-R^4$ when R^1 is a lower alkyl or phenyl; in said formula $-S-(O)-_l-A-(X)_m-R^3$, X is —CO— or $S-(O)_n-$, l and n are each 0, 1 or 2, m is 0 or 1, A is an alkylene having 1 to 8 carbon atoms, and R^3 is a lower alkyl, a cycloalkyl, naphthyl, a group of the formula:

(R^5 is a lower alkyl), a phenyl(lower)alkyl which may have a halogen substituent on the phenyl ring, a pheny which may have 1 to 3 substituents selected from the group consisting of a halogen, a lower alkyl, a lower alkoxy, a lower alkanoylamino,

hydroxy, carboxy and amino, a heterocyclic group-substituted lower alkyl which may have a substituent selected from a lower alkyl and amino wherein the heterocyclic group is selected from pyridyl, furyl, and thiazolyl, or a heterocyclic group containing 1 to 4 hetero atoms selected from nitrogen, oxygen and sulfur which may have 1 to 2 substituents selected from the group consisting of a lower alkyl, a halogen, carboxy, oxo, amino, a lower alkoxycarbonyl, a lower alkoxy, hydroxy, nitro, phenyl, a cycloalkyl and a lower alkylamino, wherein the heterocyclic group containing 1 to 4 hetero atoms is selected from thienyl, furyl, pyrrolyl, pyridyl, pyranyl, pyrimidyl, quinolyl, 1,2,3,4-tetrahydroquinolyl, imidazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, 1H-1,2,4-triazolyl, 4H-1,2,4-triazolyl, thiazolyl, 1,2,3,4-tetrazolyl, benzimidazolyl, quinazolyl, 2,4-dihydroquinazolyl, and 3H,4H-1,3,4-benzotriazepinyl, and when m is 0, R^3 may also be a group of the formula: $-NR^6R^7$ wherein R^6 is hydrogen, a lower alkyl or a phenyl lower)alkyl, and R^7 is hydrogen, a lower alkyl, a group —C-Z—NHR^8 (Z is sulfur or an imino which may be substituted with a lower alkyl, and R^8 is a lower alkyl or imino), a tetrazolyl which may have a lower alkyl substituent, or a group —CO—R^9, wherein R^9 is a lower alkyl, a phenyl which may have 1 to 3 lower alkoxy substituents, a cycloalkyl or a 5- or 6-membered unsaturated heterocyclic group containing one hetero atom selected from nitrogen and oxygen, which group is pyridyl, pyranyl, pyrrolyl or furyl, or the R^6 and R^7 may combine together with the nitrogen atom to which they are joined to form a group



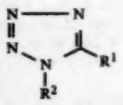
in said formula —B—CO—R^4, B is a lower alkylene, and R^4 is a group of the formula: $-NR^{10}R^{11}$ wherein R^{10} and R^{11} are the same or different and are each a lower alkyl (which may have a substituent selected from the group consisting of hydroxy, furyl, pyridyl, phenyl and a phenyl having 1 to 2 lower alkoxy substituents), a cycloalkyl (which may have a substituent selected from the group consisting of hydroxy or a lower alkoxy), a phenyl (which may have 1 to 2 substituents selected from the group consisting of a lower alkyl, a lower alkoxy, a halogen, nitro, carboxy and a lower alkylamino), or a thiazolyl, or the R^{10} and R^{11} may combine together with the nitrogen atoms to which they are joined with or without being intervened with nitrogen or oxygen to form a 5- or 6-membered saturated heterocyclic group selected from pyrrolidino, morpholino, 1-piperidyl and 1-piperazinyl which may have a lower alkyl substituent,

provided that when m is 0, R^3 is not substituted phenyl(lower)alkyl or unsubstituted phenyl,

and provided that when B is methylene or dimethylmethylene ($-C(CH_3)_2-$), R^4 excludes di-(lower)alkylamino and 1-piperidyl,

or a pharmaceutically acceptable salt thereof.

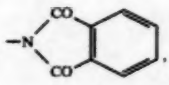
24. An anti-ulcer composition, which comprises as active ingredient an effective amount of a tetrazole derivative of the formula:



(1)

wherein R^1 is a lower alkyl, phenyl or a group of the formula: $-S(O)_l-A-(X)_m-R^3$, and R^2 is hydrogen, a lower alkyl, phenyl or a cycloalkyl when R^1 is the group $-S(O)_l-A-(X-)_m-R^3$, or R^2 is a group of the formula: —B—CO—R^4 when R^1 is a lower alkyl or phenyl; in said formula $-S(O)_l-A-(X-)_m-R^3$, X is —CO— or $S-(O)_n-$, l and n are each 0, 1 or 2, m is 0 or 1, A is an alkylene having 1 to 8 carbon atoms, and R^3 is a lower alkyl, a cycloalkyl, naphthyl, a group of the formula:

(R^5 is a lower alkyl), a phenyl(lower)alkyl which may have a halogen substituent on the phenyl ring, a phenyl which may have 1 to 3 substituents selected from the group consisting of a halogen, a lower alkyl, a lower alkoxy, a lower alkanoylamino, hydroxy, carboxy and amino, a heterocyclic group-substituted lower alkyl which may have a substituent selected from a lower alkyl and amino wherein the heterocyclic group is selected from pyridyl, furyl and thiazolyl, or a heterocyclic group containing 1 to 4 hetero atoms selected from nitrogen, oxygen and sulfur which may have 1 to 2 substituents selected from the group consisting of a lower alkyl, a halogen, carboxy, oxo, amino, a lower alkoxycarbonyl, a lower alkoxy, hydroxy, nitro, phenyl, a cycloalkyl and a lower alkylamino, wherein the heterocyclic group containing 1 to 4 hetero atoms is selected from thienyl, furyl, pyrrolyl, pyridyl, pyranyl, pyrimidyl, quinolyl, 1,2,3,4-tetrahydroquinolyl, imidazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, 1H-1,2,4-triazolyl, 4H-1,2,4-triazolyl, thiazolyl, 1,2,3,4-tetrazolyl, benzimidazolyl, quinazolyl, 2,4-dihydroquinazolyl, and 3H,4H-1,3,4-benzotriazepinyl, and when m is 0, R^3 may also be a group of the formula: $-NR^6R^7$ wherein R^6 is hydrogen, a lower alkyl or a phenyl(-lower)alkyl, and R^7 is hydrogen, a lower alkyl, a group —C-Z—NHR^8 (Z is sulfur or an imino which may be substituted with a lower alkyl, and R^8 is a lower alkyl or amino, a tetrazolyl which may have a lower alkyl substituent, or a group —CO—R^9, wherein R^9 is a lower alkyl, a phenyl which may have 1 to 3 lower alkoxy substituents, a cycloalkyl or a 5- or 6-membered unsaturated heterocyclic group containing one hetero atom selected from nitrogen and oxygen, said group being pyrrolidino, morpholino, 1-piperidinyl or 1-piperazinyl, or the R^6 and R^7 may combine together with the nitrogen atom to which they are joined to form a group



in said formula —B—CO—R^4, B is a lower alkylene, and R^4 is a group of the formula: $-NR^{10}R^{11}$ wherein R^{10} and R^{11} are the same or different and are each a lower alkyl (which may have a substituent selected from the group consisting of hydroxy, furyl, pyridyl, phenyl and a phenyl having 1 to 2 lower alkoxy substituents), a cycloalkyl (which may have a substituent selected from the group consisting of hydroxy or a lower alkoxy), a phenyl (which may have 1 to 2 substituents selected from the group consisting of a lower alkyl, a lower alkoxy, a halogen, nitro, carboxy and a lower alkylamino), or a thiazolyl, or the R^{10} and R^{11} may combine together with the nitrogen atom to which they are joined with or without being intervened with nitrogen or oxygen to form a 5- or 6-membered saturated heterocyclic group which may have a lower alkyl substituent, provided that when m is 0, R^3 is not unsubstituted phenyl(lower)alkyl or unsubstituted phenyl, and provided that when B is methylene or dimethylmethylene ($-C(CH_3)_2-$), R^4 excludes di-(lower)alkylamino and 1-piperidyl, or a pharmaceutically acceptable salt thereof in admixture with a carrier or diluent.

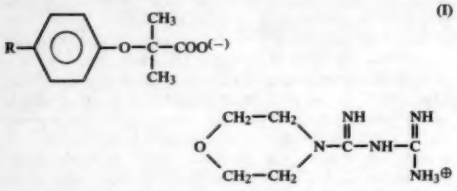
4,372,954

MOROXYDINE PHENOXYISOBUTYRATES AND METHOD OF USE

Pierre D. Moreau, 61 Grande Rue, Bessancourt, France (95550), and Nils A. Jonsson, Jungfrudansen 15, Solna S-171 56, Sweden

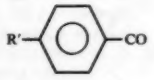
PCT No. PCT/FR81/00012, § 371 Date Oct. 1, 1981, § 102(e) Date Oct. 1, 1981, PCT Pub. No. WO81/02295, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 5, 1981, Ser. No. 308,546
Claims priority, application France, Feb. 11, 1980, 80 02927; Jan. 14, 1981, 81 00522
Int. Cl.³ A61K *31/535;* C07D *295/14*
U.S. Cl. 424—248.53 4 Claims

1. Moroxydine phenoxyisobutyrates corresponding to the following general formula:



(I)

in which R represents a chlorine atom or a



group, R' being a chlorine atom.

4. Method of inhibiting platelet aggregation and lowering fibrinogen in mammals, comprising administering an efficient quantity of a moroxydine phenoxyisobutyrate according to claim 1, 2 or 3 to the animal.

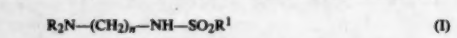
4,372,955

ANTI-ARRYTHMIC SULPHONAMIDE COMPOSITIONS

Ljerka Jozic, Hanover, Fed. Rep. of Germany, assignor to Johann A. Wuelfing, Fed. Rep. of Germany

Division of Ser. No. 148,139, May 9, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,468
Claims priority, application United Kingdom, May 16, 1979, 7917035
Int. Cl.³ A61K *31/495, 31/445, 31/40*
U.S. Cl. 424—250 3 Claims

1. An anti-arrythmic composition comprising a carrier and an anti-arrythmic amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or acid addition salt with a pharmaceutically acceptable acid, wherein NR_2 is 2,6- or 3,5-dimethylpiperidyl, pyrrolidyl, cis-2,4- or cis-2,5-dimethylpyrrolidyl, N-methylpiperazyl or 2-methylpiperidyl; n is 2 or 3; and R^1 is 1-naphthyl unsubstituted or substituted by methyl, methoxyl, methoxycarbonyl or ethoxycarbonyl or amino optionally substituted by one or two C_{1-6} alkyl groups.

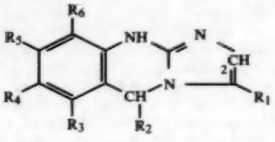
4,372,956

5, 10-DIHYDROIMIDAZO[2,1-B]QUINAZOLINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hans Ott, Pfeffingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 18, 1980, Ser. No. 207,903
Claims priority, application Switzerland, Nov. 24, 1979, 10453/79
Int. Cl.³ A61K *31/505;* C07D *487/04*
U.S. Cl. 424—251 25 Claims

1. A compound of formula I



I

in which

R_1 is H, (C_{1-4})alkyl, phenyl or (C_{7-11}) phenylalkyl, the phenyl ring of the last two radicals being unsubstituted or mono- or independently di-substituted by (C_{1-4})alkyl or -alkoxy or by halogen,

R_2 is H, (C_{1-4})alkyl, phenyl or phenyl, mono- or independently di-substituted by (C_{1-4})alkyl or -alkoxy or by halogen and one of

R_3 to R_6 is H and the remaining radicals R_3 to R_6 independently are H, (C_{1-4})alkyl or -alkoxy, hydroxy, halogen and if desired any two adjacent remaining radicals R_3 to R_6 represent —OCH_2O—

with the proviso that at least one of the radicals R_1 to R_6 is other than H or pharmaceutically acceptable acid addition salt form.

3. A pharmaceutical composition useful in treating heart insufficiency, inducing a cardiotonic or vasodilating effect or inhibiting blood platelet aggregation which comprises a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4. A method of treating heart insufficiency, including a cardiotonic or vasodilating effect or inhibiting blood platlet aggregation, which comprises administering a therapeutically effective amount of a compound of claim 1 to a subject in need of such treatment.

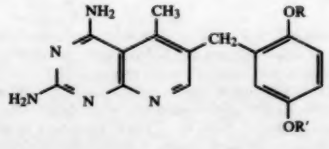
4,372,957

TREATMENT WITH DIALKOXY PYRIDOPYRIMIDINES

David S. Duch, Cary; Charles A. Nichol, Durham, and Carl W. Sigel, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 159,243, Jun. 13, 1980, abandoned. This application Jan. 23, 1981, Ser. No. 228,164
Claims priority, application United Kingdom, Jun. 14, 1979, 7920703
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 7 Claims

1. A method of treating psoriasis in a mammal suffering from psoriasis comprising the administration to said mammal of a non-toxic, effective antipsoriasis amount of a compound of formula (II):



(II)

wherein R and R′ are lower (C_1–C_6) alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4,372,958

COMPOUND HAVING ANTITUSSIVE ACTIVITY

Vittorio Pestellini; Mario Ghelardoni, both of Florence; Danilo Giannotti, Lucca; Alberto Meli, and Carlo A. Maggi, both of Florence, all of Italy, assignors to A. Menarini S.A.S., Italy

Filed Jun. 10, 1981, Ser. No. 272,281

Claims priority, application Italy, Feb. 25, 1981, 9343 A/81

Int. Cl.³ A61K *31/52*; C07D *473/08*

U.S. Cl. 424—253 **4 Claims**

1. 3(4-phenyl-1-piperazinio-1-yl)-1,2-propanediol 3(theophyllin-7-yl)-1-propanesulphonate.

2. A drug having antitussive action which contains an antitussive effective amount of the compound 3 (4-phenyl-1-piperazinio-1-yl)-1,2-propanediol 3(theophyllin-7-yl)-1-propanesulphonate.

4,372,959

1-(5-OXOHEXYL)-3-ALKYL-7-(2-OXOPROPYL)XANTHINES

Joachim E. Goring, Gronau, Fed. Rep. of Germany, assignor to Beecham-Wulfing GmbH & Co. KG, Fed. Rep. of Germany

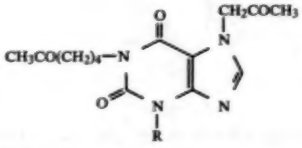
Filed Jun. 17, 1981, Ser. No. 274,524

Claims priority, application United Kingdom, Jun. 21, 1980, 8020418

Int. Cl.³ A61K *31/52*; C07D *473/04*

U.S. Cl. 424—253 **6 Claims**

1. A compound of the formula (I):



(I)

wherein R is alkyl of 1 to 4 carbon atoms.

5. A pharmaceutical composition for the treatment of peripheral vascular diseases in mammals, which comprises a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

4,372,960

QUATERNARY DERIVATIVES OF N-(SUBSTITUTED-AMINOALKYL)-2-OXO-1-PYRROLIDINE-ACETAMIDES AS COGNITION ACTIVATORS

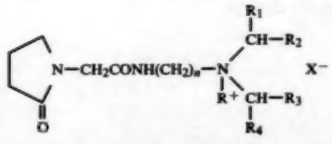
Yvon J. L'Italien, Plymouth, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 12, 1980, Ser. No. 215,959

Int. Cl.³ A61K *31/40, 31/445*; C07D *207/27, 401/12*

U.S. Cl. 424—267 **12 Claims**

1. A compound having the structural formula:



wherein R is alkyl of from 1 to 3 carbon atoms, R_1 and R_4 may be the same or different and are hydrogen or methyl; R_2 and R_3 may be the same or different and are hydrogen, alkyl of from 1 to 3 carbon atoms or when taken together can complete a pyrrolidine, piperidine, morpholine or piperazine ring; n is an integer of from 1 to 3; X^- is a pharmaceutically acceptable anion; with the proviso that when R is n-C_3H_7, n is 2 and X^- is I; then R_1–R_4 may not all be hydrogen.

4,372,961

DERIVATIVES OF RIFAMYCINS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

Tiberio Bruzzese, Via Frua 21/6, Milan, Italy (20146), and Lorenzo Ferrari, Via Biella 8, Milan, Italy (20143)

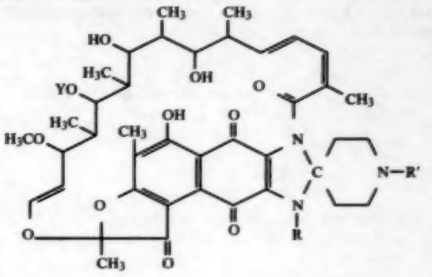
Filed Jul. 17, 1981, Ser. No. 284,565

Claims priority, application United Kingdom, Jul. 18, 1980, 8023606

Int. Cl.³ A61K *31/445*; C07D *498/20*

U.S. Cl. 424—267 **3 Claims**

1. A compound of the formula:



wherein Y is a hydrogen atom or an acetyl radical, R is a hydrogen atom, a straight-chained or branched, saturated or monoolefinically unsaturated aliphatic hydrocarbon radical, containing up to 5 carbon atoms, which can be substituted by hydroxyl or amino groups, a phenyl radical which can be substituted by hydroxyl, amino or by carboxyl groups, a benzyl or phenethyl radical or a cycloalkyl radical containing 3 to 6 carbon atoms and R′ is a hydrogen atom, a straight-chained or branched saturated or monoolefinically unsaturated aliphatic hydrocarbon radical, containing up to 8 carbon atoms, which can be substituted by hydroxyl or by amino groups, a cycloalkyl radical containing 3 to 6 carbon atoms or a benzyl or phenethyl radical; and the pharmacologically acceptable salts thereof.

3. Compositions with an antibiotic activity against gram-positive microorganisms comprising an antibiotically-effective amount of at least one compound of the general formula given in claim 1, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,372,962

CLAVULANIC ACID DERIVATIVES THEIR PREPARATION AND USE

John S. Davies, and Gerald Brooks, both of Reigate, England, assignors to Beecham Group Limited, England

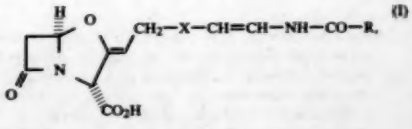
Filed May 13, 1980, Ser. No. 149,322

Claims priority, application United Kingdom, May 17, 1979, 7917210

Int. Cl.³ C07D *498/04*; A61K *31/42*

U.S. Cl. 424—272 **120 Claims**

1. A compound of the formula (I):



(I)

a pharmaceutically acceptable salt thereof,

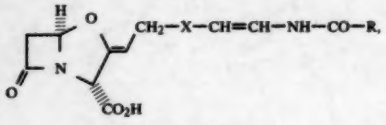
the p-nitrobenzyl ester thereof or an ester thereof of the formula

$$-CO-O-CHR_1-O-CO-R_2 \quad (a)$$

wherein R_1 is hydrogen, methyl or phenyl; R_2 is alkyl of 1 to 6 carbon atoms, phenyl, alkyl of 1 to 3 carbon atoms mono-substituted by phenyl, alkoxy of 1 to 6 carbon atoms, phenoxl or alkoxyl of 1 to 3 carbon atoms mono-substituted by phenyl; or R_1 and R_2 together with the —CH—O—CO— form a phthalidyl or 3,4-dimethoxyphthalidyl moiety,

wherein R is hydrogen or alkyl of 1 to 6 carbon atoms, and X is a sulphur atom, SO or SO_2.

7. A method of treating bacterial infections in mammals which comprises administering to a mammal in need thereof an antibacterially effective amount of a compound of the formula (I)



(I)

a pharmaceutically acceptable salt thereof,

the p-nitrobenzyl ester thereof or an ester thereof of the formula

$$-CO-O-CHR_1-O-CO-R_2 \quad (a)$$

wherein R_1 is hydrogen, methyl or phenyl; R_2 is alkyl of 1 to 6 carbon atoms, phenyl, alkyl of 1 to 3 carbon atoms mono-substituted by phenyl, alkoxy of 1 to 6 carbon atoms, phenoxl or alkoxyl of 1 to 3 carbon atoms mono-substituted by phenyl; or R_1 and R_2 together with the —CH—O—CO— form a phthalidyl or 3, 4-dimethoxyphthalidyl moiety,

wherein R is hydrogen or alkyl of 1 to 6 carbon atoms and X is a sulphur atom, SO or SO_2, in combination with a pharmaceutically acceptable carrier.

4,372,963
OXAZOLYL, ISOXAZOLYL, TRIAZOLYL AND THIADIAZOLYL ALKYL BISAMIDINES

Graham J. Durant, Welwyn Garden, and Peter D. Miles, Hitchin, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden, England

Division of Ser. No. 93,336, Nov. 13, 1979, Pat. No. 4,285,952, which is a division of Ser. No. 902,145, May 2, 1978, Pat. No. 4,212,875. This application Mar. 27, 1981, Ser. No. 248,386

Claims priority, application United Kingdom, May 5, 1977, 18881/77

Int. Cl.[3] **A61K** *31/41, 31/42;* **C07D** *249/08, 261/08, 263/32, 285/10, 285/12*

U.S. Cl. 424—272 **11 Claims**

1. A compound of the structure

in which

Het is a 5-membered fully unsaturated heterocycle containing at least one nitrogen atom, said heterocycle being oxazole, isoxazole, 1,2,4-triazole or 1,2,5-thiadiazole, and optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen or lower alkoxy, or 1,3,4-thiadiazole optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen, lower alkoxy or amino, said heterocycle being attached at a ring carbon;

Z is sulphur or methylene;

m is 0, 1 or 2, n is 2 or 3, and m+n is 3 or 4;

R is hydrogen or lower alkyl;

each of X^1 and X^2 is sulphur, a nitromethylene group $CHNO_2$, or an imino group NY, where Y is hydrogen, hydroxy, lower alkyl, cyano or carbamoyl $CONH_2$; and

q is from 2 to 12; in the form of the free base or its pharmaceutically-acceptable acid addition salts.

11. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,372,964
ANTIINFLAMMATORY 4,5-DIARYL-1H-IMIDAZOLE-2-METHANOLS

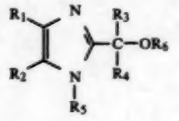
Joel G. Whitney, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 199,731, Oct. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 181,991, Aug. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 109,923, Jan. 7, 1980, abandoned. This application Aug. 20, 1981, Ser. No. 294,747

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/64*

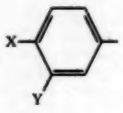
U.S. Cl. 424—273 R **36 Claims**

1. A compound of the formula



wherein

R_1 and R_2 independently are 3-pyridyl, 2-thienyl or



where

X is H, F, Cl, Br, C_1–C_2 alkyl, C_1–C_2 alkoxy, di(C_1–C_2 alkyl)amino or $CH_3S(O)_n$;

n=0, 1 or 2;

Y is H, F or Cl with the proviso that when Y is F or Cl, then X must be F or Cl;

R_3 and R_4 independently are H, C_1–C_3 alkyl, cyclopropyl, CF_3, CF_2H, CF_2Cl, CF_3CF_2 or $CF_3CF_2CF_2$;

with the proviso that no more than one of R_3 and R_4 can be H;

R_5=H or C_1–C_3 alkyl;

R_6=H; C_1–C_3 alkyl;

or —$COOR_7$;

where

R_7 is C_1–C_2 alkyl; with the proviso that

R_5 and R_6 cannot both be C_1–C_3 alkyl; a pharmaceutically suitable acid addition salt where R_1 or R_2 is 3-pyridyl or where X is dialkylamino, or a pharmaceutically suitable metal salt thereof when at least one of R_5 and R_6 is H.

19. A method of treating inflammation in a mammal which

comprises administering to the mammal an antiinflammatory amount of a compound of claim 1.

4,372,965
6-, 1- AND 2-SUBSTITUTED-THIO-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACID S-OXIDES

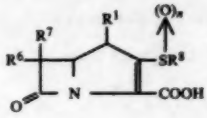
Burton G. Christensen, Scotch Plains, and David H. Shih, Manalapan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 84,932, Oct. 15, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,505

Int. Cl.³ C09D *487/04;* H61K *31/40*

U.S. Cl. 424—274 **8 Claims**

1. A compound having the structure:



wherein: R^1, R^6, R^7 and R^8 are independently selected from the group consisting of hydrogen, (R^1 is not H) substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; aralkyl, aralkenyl and aralkynyl wherein the aryl moiety is phenyl and the alkyl chain has 1–6 carbon atoms; wherein the substituents or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono-, di-, and trialkylamino, hydroxyl, alkoxyl, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; n is 1 or 2.

7. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,372,966
USE OF DIHYDRO-1H-PYRROLIZINE-3,5(2H,6H)-DIONE AS A COGNITION ACTIVATOR

Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 186,945, Sep. 15, 1980. This application Aug. 7, 1981, Ser. No. 290,114

Int. Cl.³ A61K *31/40*

U.S. Cl. 424—274 **15 Claims**

10. A method of treating senility, of enhancing memory or of reversing amnesia caused by electroconvulsive shock in humans which comprises administering to said human an effective amount of dihydro-1H-pyrrolizine-3,5(2H,6H)-dione.

4,372,967
3H-DIHYDROFURANONE-2 DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Michel Langlois, Buc; Alain P. Lacour, La Varenne; Bernard P. Bucher, Marnes la Coquette, and Gisele C. Mocquet, Paris, all of France, assignors to Delalande S.A., Courbevoie, France

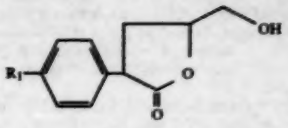
Division of Ser. No. 144,075, Apr. 28, 1980, Pat. No. 4,346,102. This application Feb. 26, 1982, Ser. No. 352,911

Claims priority, application France, May 7, 1979, 79 11453; Apr. 4, 1980, 80 07659

Int. Cl.³ A61K *31/365;* C07D *307/32, 307/20*

U.S. Cl. 424—279 **9 Claims**

1. Compound having the formula



in which R_1 is selected from the group consisting of 3-methylbutoxy, cyclohexylmethoxy, metanitrobenzyloxy, metacyanobenzyloxy and 3-cyano-5-nitrobenzyloxy, mixtures of four diastereoisomers thereof, mixtures of two trans diastereoisomers thereof and mixtures of two cis diastereoisomers thereof.

4,372,968
GRANULES OF SODIUM ASCORBATE AND THE PRODUCTION THEREOF

Nobuyuki Kitamori, Suita; Keizi Hemmi, Osaka, and Masaya Maeno, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 29, 1980, Ser. No. 201,965

Int. Cl.³ A61K *31/365*

U.S. Cl. 424—280 **22 Claims**

1. Sodium L-ascorbate granules consisting substantially of sodium L-ascorbate and a binder, wherein the content of sodium L-ascorbate is from about 98.5 to 99.5 weight percent, on dry basis, of the granule and not less than about 80 weight percent of the granule having a particle size of 177 to 840μ which are produced by spraying sodium L-ascorbate powder having a particle size of not more than 250μ and not less than about 80 weight percent of said powder having a particle size of not more than 149μ, while allowing it to fluidize in a fluidized-bed granulator, with a solution containing a binder in an amount corresponding to about 0.5 to 1.5 weight percent of the total weight of finished product on a dry basis, and while maintaining the water content of the composition during the granulating process below about 7 weight percent throughout the entire process.

4,372,969
ADDITION SALTS OF SUBSTITUTED ARALKYLAMINES, THEIR METHOD OF PREPARATION AND THEIR USE AS PHARMACEUTICALS

Louis Lafon, Paris, France, assignor to Societe Anonyme Dite: Laborstoire L. Lafon, Maisons-Alfort, France

Continuation of Ser. No. 121,503, Feb. 14, 1980, abandoned, which is a continuation of Ser. No. 967,897, Dec. 11, 1978, abandoned. This application Feb. 19, 1981, Ser. No. 235,937

Claims priority, application United Kingdom, Dec. 13, 1977, 51836/77

Int. Cl.³ A61K *31/36;* C07D *317/44;* C07C *91/06;* A61K *31/135*

U.S. Cl. 424—282 **7 Claims**

1. An acid addition salt of substituted aralkylamine, for use in particular in therapy as antidepressant of the central nervous system, selected from the group consisting of 2-isopropylamino-1-phenyl-1-ethanol methanesulphonate, 2-tertiobutylamino-1-phenyl-1-ethanol hemifumarate, 2-tertiobutylamino-1-phenyl-1-ethanol methanesulphonate, N-isopropyl-piperonylamine methanesulphonate, and N-isopropyl-piperonylamine propionate.

7. A pharmaceutical composition for alleviating depression of the central nervous system comprising an antidepressant effective amount of a component of claim 1.

4,372,970

BENZOFURAN ACETIC ACID ESTERS AND THEIR ARTHROPOCIDAL COMPOSITIONS

Malcolm R. Hadler, Tarporley; David R. Woodward, Runcorn, and Andrew A. Godfrey, Acton Bridge, all of England, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

PCT No. PCT/GB80/00198, § 371 Date Jul. 9, 1981, § 102(e) Date Jul. 9, 1981, PCT Pub. No. WO81/01408, PCT Pub. Date May 28, 1981

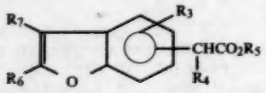
PCT Filed Nov. 14, 1980, Ser. No. 285,183

Claims priority, application United Kingdom, Nov. 15, 1979, 7939600

Int. Cl.³ C07D *307/78*; A01N *43/08*

U.S. Cl. 424—282 **7 Claims**

1. A compound of the formula (I)

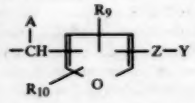


wherein R_6 and R_7 are each independently a hydrogen, or halogen atom, or a C_1 to C_4 alkyl, aralkyl, aryl, C_1 to C_4 alkoxy, or C_2 to C_4 alkenyl or trifluoromethyl group, or R_6 and R_7 may be together a methylenedioxy;

R_3 is a hydrogen, or halogen atom, or a C_1 to C_4 alkyl or C_1 to C_4 alkoxy group;

R_4 is a C_1 to C_4 alkyl, C_2 to C_4 alkenyl, C_2 to C_4 alkynyl, C_1 to C_4 alkoxy, cyano, halogen-substituted C_1 to C_4 alkyl, halogen-substituted C_2 to C_4 alkenyl group, or a C_3 to C_5 alicylic group; and

R_5 is a group of one of the following structural formulae:



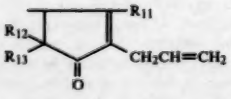
where A is a hydrogen atom, or a cyano group, or a —C≡CH group, or a

group;

R_9 and R_{10} are each independently a hydrogen atom, or a C_1 to C_4 alkyl or C_2 to C_4 alkenyl group;

Z is an oxygen or a sulphur atom, or a —CH_2— or —CO— group; and

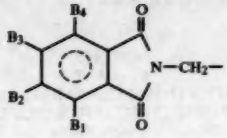
Y is a hydrogen atom, or a C_1 to C_4 alkyl, C_2 to C_4 alkenyl, C_2 to C_4 alkynyl or an aryl or furyl group which is either unsubstituted, or is substituted by one or more C_1 to C_4 alkyl, C_2 to C_4 alkenyl or C_1 to C_4 alkoxy groups or halogen atoms;



where:

R_{11} is a hydrogen atom, or a methyl group, and

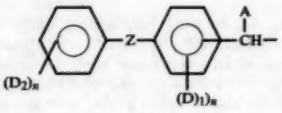
R_{12} and R_{13} are each independently a hydrogen atom, or a C_1 to C_4 alkyl group;



where:

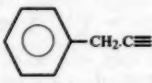
is a benzene ring, or a dihydro- or tetrahydro-benzene ring; and

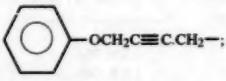
B_1, B_2, B_3, B_4 are each independently a hydrogen, or halogen atom, or a methyl group;

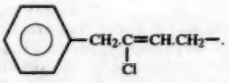


where: D_1 and D_2 are each independently a halogen atom or a methyl group;

each n is independently 0, 1 or 2; and A and Z are as defined above;







3. A composition comprising a compound as claimed in claim 1 in an arthropocidally effective amount or concentration in combination with a carrier or diluent.

4,372,971

HETEROCYCLIC PROSTAGLANDIN TYPE COMPOUNDS, MEDICAMENTS CONTAINING THEM AND PROCESSES FOR THE PREPARATION AND USE OF THESE HETEROCYCLIC COMPOUNDS AND MEDICAMENTS

Ulrich Seipp, Aachen; Werner Vollenberg, Stolberg; Bernd Mueller, and Gudrun Michel, both of Aachen, all of Fed. Rep. of Germany, assignors to Gruenenthal GmbH, Stolberg, Fed. Rep. of Germany

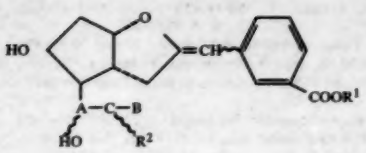
Filed Aug. 6, 1981, Ser. No. 290,573

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3029984

Int. Cl.³ A61K *31/557*; C07D *307/935*; A61K *31/34*

U.S. Cl. 424—285 **42 Claims**

1. A heterocyclic compound of the formula



(I)

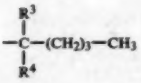
in which the phenyl radical with respect to the double bond has the E-, the EZ- or the Z-configuration and in which at the carbon atom 15 which carries the group R^2 there exists the RS- or S-configuration, wherein

R^1 represents hydrogen, an alkyl group containing 1 to 6 carbon atoms or a pharmaceutically acceptable cation,

R^2 represents hydrogen or a methyl group,

A represents $-CH_2-CH_2-$,(trans)$-CH=CH-$ or $-C\equiv C-$, and

B represents an alkyl group containing 5 to 9 carbon atoms and having the structure



wherein R^3 and R^4 have the same or a different meaning and each represents hydrogen, methyl or ethyl, or B represents cyclohexyl or cyclohexyl substituted in position 4' by a methyl or an ethyl group.

42. A method for simultaneously inhibiting blood platelet aggregation and lowering blood pressure, comprising the step of administering to a human patient an amount of a compound as defined by claim 1, which is sufficient to simultaneously inhibit blood platelet aggregation and lower the blood pressure.

4,372,972

N-SUBSTITUTED ALKYNYL ANILINES

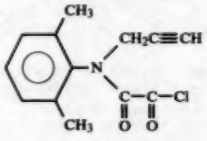
Hak-Foon Chan, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 14, 1979, Ser. No. 75,563

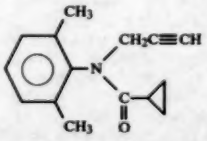
Int. Cl.³ A01N *37/22*; C07C *103/737*

U.S. Cl. 424—304 **8 Claims**

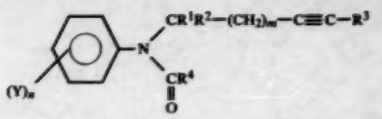
1. A compound according to the formula



2. A compound having the formula



5. A method for controlling phytopathogenic fungi in agronomic crops which comprises applying to the plant, the plant seed, or the plant habitat, a fungicidally effective amount of a compound of the formula



wherein R^1, R^2 and R^3 are independently hydrogen, (C_1-C_4) alkyl, (C_2-C_4)alkenyl, (C_2-C_4)alkynyl, (C_3-C_8)cycloalkyl, (C_5-C_8)cycloalkenyl, halogen, cyano, carbo$(C_1-C_1$. 0)alkoxy, or aryl or aryl(C_1-C_4)alkyl the aryl portion of which is optionally substituted;

R^4 is (C_3-C_8) cycloalkyl, (C_5-C_8)cycloalkenyl, mono or di(C_1-C_6)alkylamino(C_1-C_4)alkyl, mono or di(C_2-C_6)alkenylamino(C_1-C_4)alkyl, mono or di(C_2-C_6)alkynylamino(C_1-C_4)alkyl, or halocarbonyl;

Y is halogen, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, nitro, mono or di(C_1-C_4)alkylamino, trihalomethyl, cyano, phenyl, phenoxy, phenylthio, phenylsulfinyl, or phenylsulfonyl, the aryl portion of which is optionally substituted; and

m and n are independently zero or an integer from 1 to 3.

4,372,973

16-AMINO-POSTAGLANDIN DERIVATIVES, THEIR ACID ADDITION SALTS, AND A PROCESS FOR THE PREPARATION THEREOF

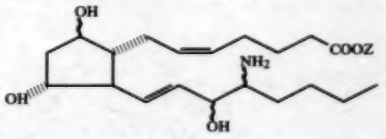
Gabor Ambrus; Eva Toth-Sarudy; György Cseh; Istvan Barta, and Gyula Horvath, all of Budapest, Hungary, assignors to Gyogyszerkutato Intezet, Budapest, Hungary

Continuation-in-part of Ser. No. 265,433, May 20, 1981, abandoned. This application Dec. 21, 1981, Ser. No. 332,840

Int. Cl.³ A61K *31/557*; C07C *177/00*

U.S. Cl. 424—305 **7 Claims**

1. 16-Amino-prostaglandin derivatives of general formula I



wherein C-15 and C-16 may have either S or R configuration, Z stands for a hydrogen atom or a lower alkyl group, and their acid addition salts.

4,372,974

ANTICONVULSIVE COMPOSITIONS AND METHOD OF TREATING CONVULSIVE DISORDERS

Irving Fish, Tenafly, N.J.; Stephen A. Schwartz, Bronx, and Stanley Samuels, White Plains, both of N.Y., assignors to New York University, New York, N.Y.

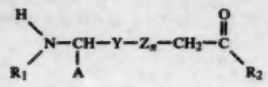
Continuation-in-part of Ser. No. 162,907, Jun. 25, 1980, Pat. No. 4,322,440. This application Jun. 2, 1981, Ser. No. 269,629

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ A61K *31/195*

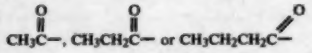
U.S. Cl. 424—319 **38 Claims**

1. A method for controlling seizures in a mammal in need of such treatment which comprises administering to said mammal prior to the onset of a seizure a composition comprising a solid oral dosage form, said oral dosage form containing a pharmaceutical formulation comprising an effective amount for controlling seizures of a member selected from the group consisting of compounds having the general formula



wherein

R_1 is H,



A is H, CH_3, CH_3CH_2—, HO-CH_2, HO-CH_2CH_2, CH_3OCH_2—HS—CH_2—, HS—CH_2CH_2—, CH_3SCH_2—,

Y is C=O, HC—OH or, CH—A,

Z is CH—A, O, S; and

R_2 is —OH,

n is 1, and Y is CH—A when n=0; and

A+Y+Z include no more than one Oxygen or Sulfur atom and acid addition salts of such compounds,

said formulation having a pH between about 1.8 and 6.0.

4,372,975

SUBSTITUTED 2-BENZOYL-4-CHLOROGLYCINANILIDE DERIVATIVES, A PROCESS FOR THEIR PRODUCTION, AND THEIR USE AS MEDICAMENTS

Gilbert Mouzin; Henri Cousse; Antoine Stenger, all of Castres, France, and Sylvano Casadio, Milan, Italy, assignors to Pierre Fabre SA, Paris, France

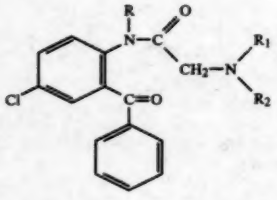
Continuation-in-part of Ser. No. 916,651, Jun. 19, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 200,622

Claims priority, application France, Jun. 16, 1977, 77 18511

Int. Cl.³ A61K *31/165;* **C07C** *103/133*

U.S. Cl. 424—324 **17 Claims**

1. A compound of the formula



wherein R is methyl,

wherein R_1 is hydrogen, and

wherein R_2 is selected from the group consisting of allyl, diethylpropargyl, ethynylcyclohexyl, cyclopropyl and methylallyl,

or a therapeutically acceptable acid addition salt thereof.

4,372,976

NOVEL ARYL-ALIPHATIC KETONE AND ITS USE AS AN ANTIVIRAL AGENT

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 7, 1981, Ser. No. 291,015

Int. Cl.³ A61K *31/12;* **C07C** *49/252*

U.S. Cl. 424—331 **3 Claims**

1. tert-Butyl (3,4-dibenzyloxy)styryl ketone.

3. A process for combatting viruses which comprises contacting the locus of said viruses with an antivirally effective amount of tert-butyl (3,4-dibenzyloxy)styryl ketone.

4,372,977

POLYOXETHYLENE DERIVATIVES AS ANTIPRURITIC ECTOPARASITICIDE

Myron J. Lover, Mountainside; Arnold J. Singer, South Orange; Donald M. Lynch, Waldwick, and William E. Rhodes, III, Cranford, all of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Continuation of Ser. No. 802,012, May 31, 1977, abandoned. This application Jan. 17, 1979, Ser. No. 4,229

Int. Cl.³ A01N *31/02, 31/14, 37/02, 37/06*

U.S. Cl. 424—342 **8 Claims**

1. A method of controlling ectoparasites or their ova which comprises applying to a human or animal host in need of such control, an effective toxic amount of at least one derivative of polyoxyethylene having an HLB of about 2.5–13.5, said derivative being an alkyl ether thereof having 12–24 carbon atoms in the alkyl moiety.

4,372,978

ANTIBACTERIAL AGENT AND METHOD

John R. Gilbertson, Pittsburgh, and Richard J. Crout, Monroeville, both of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Division of Ser. No. 97,405, Nov. 26, 1979, which is a division of Ser. No. 6,347, Jan. 25, 1979, Pat. No. 4,209,533. This application Aug. 7, 1981, Ser. No. 291,026

Int. Cl.³ A61K *31/045, 7/16*

U.S. Cl. 424—343 **3 Claims**

1. A method of inhibiting growth of bacteria comprising

exposing said bacteria to an effective concentration of a polyunsaturated long-chain alcohol selected from the group consisting of linolenyl alcohol and linoleyl alcohol,

selecting said bacteria from the group consisting of *Clostridium butyricum, Clostridium perfringens, Streptococcus mutans, Streptococcus mutans BHT and* Steptococcus sanguis, and

providing said alcohol in a food product.

4,372,979

REDUCTION OF CURD FINES IN CHEESE MANUFACTURE

George W. Reinbold, Wheat Ridge, and Malireddy S. Reddy, Thornton, both of Colo., assignors to Leprino Foods Company, Denver, Colo.

Continuation-in-part of Ser. No. 73,330, Sep. 7, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 236,717

Int. Cl.³ A23C *19/02, 21/02;* **C12N** *1/20*

U.S. Cl. 426—36 **18 Claims**

1. The method of making cheese by using a starter culture medium which results in a curd-whey mixture substantially free from culture medium produced curd fines, said method comprising:

(a) forming an aqueous culture medium from protein-providing medium solids selected from the class consisting of (i) mixtures of whey solids and precipitated casein in the form of a water-dispersible casein salt or (ii) mixtures of whey solids and milk solids, or (iii) mixtures of whey solids, milk solids, and precipitated casein in the form of a water-dispersible casein salt, said whey solids consisting essentially of whey protein concentrate made from whey by ultrafiltration, said medium solids providing a weight ratio within the range from 0.4 to 5.0 parts of casein (casein basis) per part of total whey protein provided by said whey solids and said milk solids, the whey protein provided by said whey solids comprising at least 10% by weight of said medium solids;

(b) heating said culture medium at a pH of from 5.6 to 6.9 to a temperature of about 160° to about 195° F. for about 20 to about 90 minutes to cause the complexing of casein and whey protein without precipitating whey protein or coagulating the medium, said medium on completion of said heating being coagulable without containing added cal-

cium or phosphate ions by addition of rennet at the rate of 3 ounces per 1000 pounds of medium with the medium at pH 6.2 and 92° F.;

(c) culturing harmless lactic acid-producing bacteria in the completed medium from step (b) to produce a bulk starter culture without coagulating said medium; and, thereafter,

(d) using said bulk starter culture as a bacterial inoculant for milk in the manufacture of cheese by adding said bulk starter culture to cheese milk and coagulating the milk with rennet, whereby complexed whey protein and casein of the bulk starter culture coagulates with the milk protein to produce a curd-whey mixture which is substantially free of curd fines from the starter medium.

4,372,980

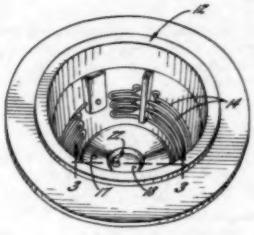
METHOD OF OPERATING A PRESSURE FRYER

Clement J. Luebke, Beloit, Wis.; John A. Mitchell, and Lowell W. Daniels, both of Rockford, Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.

Division of Ser. No. 68,108, Aug. 20, 1979, Pat. No. 4,296,310. This application Jun. 3, 1981, Ser. No. 269,550

Int. Cl.³ G01N *33/02, 33/28*

U.S. Cl. 426—231 **1 Claim**



1. A method of operating a pressure fryer having a vessel holding a food product and a bath of cooking oil, means for heating said bath, a removable cover for establishing a pressure-tight condition in said vessel when said bath is heated means in the lower portion of said vessel for detecting the presence of water in the lower portion of said vessel and for producing an electrical signal when more than a predetermined quantity of water is present in said vessel, and means in said circuit for automatically disabling said heating means when said signal is produced, said method comprising the steps of, manually actuating a main control to activate said heating means, detecting the presence of water in the lower portion of said bath, producing a signal when the concentration of water in the lower portion of said bath exceeds a predetermined threshold, and utilizing said signal to de-activate said heating means independently of said main control and independently of any manual operation thereby to prevent operation of the heating means when the concentration of water in the lower portion of said bath is in excess of said predetermined threshold, whereby said concentration of water is prevented from flashing into steam which causes the hot cooking oil to gush rapidly out of the top of the vessel when the cover is removed.

4,372,981

METHOD OF SMOKING FOOD PRODUCTS

Leon D. Lieberman, 5269-3 Newcastle St., Encino, Calif. 91316

Filed Aug. 31, 1978, Ser. No. 938,406

Int. Cl.³ A23B *4/04*

U.S. Cl. 426—235 **6 Claims**

1. A method of smoking food products which comprises the steps of:

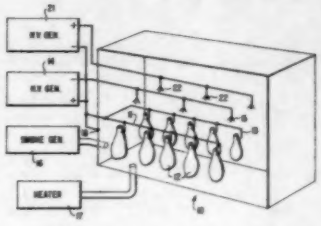
(a) placing a food product to be smoked in an enclosed space;

(b) electrically coupling said food product to a first terminal of a voltage source;

(c) locating the second terminal of said voltage source within said space whereby an electric field will be created within said space;

(d) introducing smoke into said space;

(e) applying a first voltage between said terminals, said second terminal being negative and said first terminal



being positive, and maintaining said first voltage until substantially all of said smoke has been deposited;

(f) removing said first voltage and applying a second voltage between said terminals, said second terminal being positive and said first terminal being negative, and maintaining said second voltage for a period of time whereby the charge generated by said first voltage will be neutralized; and

(g) reapplying said first voltage between said terminals.

4,372,982

REFRIGERATED SHELF STABLE DOUGH

Michael J. Haasl, Minneapolis; Kenneth D. Snider, Le Sueur, and William L. Murphy, Golden Valley, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 117,312, Jan. 31, 1980, abandoned. This application Jun. 18, 1981, Ser. No. 275,008

Int. Cl.³ A21D *6/00, 10/02*

U.S. Cl. 426—549 **9 Claims**

1. A method of processing dough to improve baked flakiness, said method comprising:

mixing flour, shortening and water and thereby form a dough mass, said shortening being in an amount sufficient to provide flakiness in a cooked product made from said dough mass;

exposing said dough mass to a reduced pressure environment wherein the vacuum pressure is at least about 27.5 inches of mercury, said exposure is for a time of at least about ½ second with said time being that time period for which the vacuum pressure is at least equal to the specified vacuum pressure, during said exposing, said dough is allowed to volumetrically expand at least about 1.1 times its pre-exposure volume; and

releasing said vacuum prior to commencement of cooking.

4,372,983

METHOD OF MAKING CHEESE

Gretz L. Hazen, Fort Atkinson, Wis., assignor to Dec International, Inc., Madison, Wis.

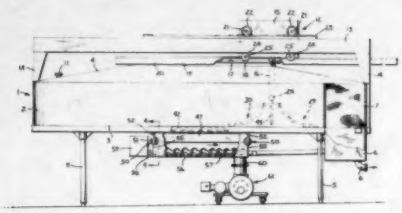
Division of Ser. No. 159,235, Jun. 13, 1980, Pat. No. 4,308,791, which is a continuation of Ser. No. 20,803, Mar. 15, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,360

Int. Cl.³ A23C *19/00*

U.S. Cl. 426—582 **3 Claims**

1. A method of cheese making, comprising the steps of positioning an agitating unit having a vertical drive shaft and reversible drive means operably connected to said shaft in a cheese finishing vat, said reversible drive means being operable to rotate said shaft in a stirring direction and an opposite un-

loading direction, mounting a stirring paddle on the agitating unit for floating vertical movement, positioning a curd engaging face of said stirring paddle in said stirring direction, mounting an unloading paddle on the agitating unit for floating vertical movement, positioning a curd engaging face of said unloading paddle in said unloading direction, introducing a quantity of cheese curd and whey into said vat, draining whey from the vat through a first outlet located in the bottom of the vat, rotating the drive means in said stirring direction to cause the



curd engaging face of said stirring paddle to lead in the direction of rotation and ride along the bottom of the vat and agitate the curd while freely trailing said unloading paddle through said curd, rotating the drive means in the unloading direction to cause the curd engaging face of the unloading paddle to lead in the direction of rotation and ride on the bottom of the vat to engage the curd and discharge the entire quantity of curd through a discharge opening, separate from said first outlet, in the bottom of the vat to the exterior while freely trailing said stirring paddle.

4,372,984

PROCESS FOR IMPROVING THE CONSISTENCY OF A RECONSTITUTED INSTANT PUREE

Heinz Bauer, Dinhard, Switzerland, assignor to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 2,853, Jan. 12, 1979, abandoned. This application May 10, 1982, Ser. No. 376,671

Claims priority, application Switzerland, Feb. 6, 1978, 1263/78

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—637 **11 Claims**

1. A process for treating a reconstitutable instant potato puree so as to improve its consistency upon reconstitution which consists of incorporating in the unreconstituted instant potato puree a material consisting of crude vegetable fibres in a quantity of from 1 to 5% by dry weight, based on the dry matter content of the puree.

8. A reconstitutable instant potato puree having improved consistency upon reconstitution which consists of (a) reconstitutable potato puree and (b) from 1 to 5% by dry weight of crude vegetable fibres, based on the dry matter content of the instant potato puree, added to the puree.

4,372,985

ION IMPLANTATION FOR HARD BUBBLE SUPPRESSION

Robert F. Bailey, Rossmoor, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 8, 1980, Ser. No. 213,976

Int. Cl.³ B05D *3/06*

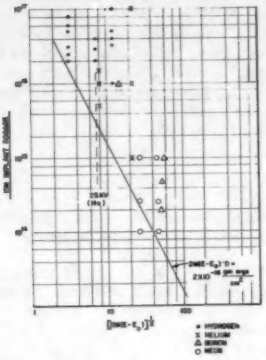
U.S. Cl. 427—38 **3 Claims**

1. A method for processing a magnetic bubble domain device comprising the steps of:

providing a non-magnetic substrate;

providing a thin layer of magnetic material capable of supporting magnetic bubble domains on a first major surface of said substrate;

directing a beam of ions consisting essentially of a non-gaseous element at said entire layer so that said ions are implanted at a depth in excess of 500 angstroms while minimizing the compressive stress in the implanted layer, and thereby minimizing the change in stress-induced anisotropy of the ion-damaged implanted layer, said entire layer still being capable of supporting magnetic bubble domains while hard bubble domains are suppressed after ion implantation.



4,372,986

POLYVINYL ALCOHOL-CLAD SHAPED ARTICLE OF VINYL CHLORIDE RESIN

Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Jul. 1, 1980, Ser. No. 165,150

Claims priority, application Japan, Jul. 9, 1979, 54-86645

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—40 **3 Claims**

1. A method for the preparation of a composite shaped article of a vinyl chloride-based resin clad with a coating layer of a polyvinyl alcohol provided on the surface of the shaped article without an intervening layer of an adhesive agent which comprises the steps of

(a) subjecting the surface of the shaped article of the vinyl chloride-based resin to exposure to an atmosphere of low temperature plasma of a gas having no polymerizability in plasma condition,

(b) coating the thus plasma-treated surface of the shaped article with an aqueous solution containing a polyvinyl alcohol dissolved therein, and

(c) drying the aqueous coating layer on the surface of the shaped article.

4,372,987

METHOD OF PRODUCING A MULTILAYER ANTI-REFLECTION COATING

Peter Ganner, Innsbruck, and Theodor Wallner, Volders, both of Austria, assignors to D. Swarovski & Co., Wattens, Austria

Filed Mar. 9, 1981, Ser. No. 241,732

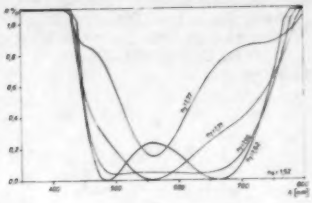
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009533

Int. Cl.³ G02B *1/10*; B05D *1/36*

U.S. Cl. 427—42 **6 Claims**

1. A method of producing a multilayer anti-reflection coating with an interference effect for optical purposes upon a substrate, of which at least one layer of the coating has a low refractive index, below n = 1.65, and at least one other layer of

the coating has a medium refractive index, from n=1.65 to n=1.80, comprising producing the layer of medium refractive



value in a vacuum in a reactive atmosphere by depositing upon said substrate a mixture of tantalic oxide and aluminum oxide which has been vaporized by means of an electron gun.

4,372,988

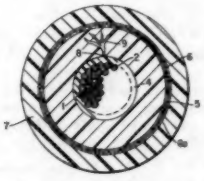
EXTENSION OF CABLE LIFE

George Bahder, Edison, N.J., assignor to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Continuation of Ser. No. 5,321, Jan. 22, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,220

Int. Cl.³ B05D 5/00

U.S. Cl. 427—52 9 Claims



1. A method for the in situ repair of an underground high voltage electrical cable for extending the life thereof, said cable including a stranded conductor and a polyolefin insulation having at least one electrochemical tree formed therein, said method being effective to counterbalance the deleterious effect of said electrochemical trees on the electrical properties of said insulation while preventing the growth of said trees, said method comprising the steps of:

drying said cable; and

continuously introducing an electrochemical tree retardant liquid to said conductor so as to cause said liquid to diffuse along said conductor between the strands thereof and into said insulation layer so as to fill said trees;

said electrochemical tree retardant liquid being a liquid having the properties of resistivity in excess of 10^9 ohms per centimeter, a relative dielectric constant below 20, and sufficiently low molecular weight to permit ready penetration into polyolefin insulation, said molecular weight being sufficiently high to prevent rapid diffusion out of said insulation entirely.

2. The method of claim 1 wherein said drying step comprises heating the cable by passing an electrical current through the conductor of said cable.

4,372,989

PROCESS FOR PRODUCING COARSE-GRAIN CRYSTALLINE/MONO-CRYSTALLINE METAL AND ALLOY FILMS

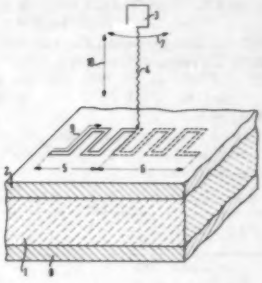
Guenther Menzel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,826

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924920

Int. Cl.³ B05D 3/06

U.S. Cl. 427—53.1 8 Claims



1. In a method of producing specifically shaped coarse-grained crystalline or monocrystalline surfaces or lines in metal or alloy films on substrates composed of a material selected from the group consisting of ceramic, glass and silicon through the conversion of an amorphous film deposited at a temperature ranging from about room temperature to about −160° C. on a surface of such substrate, the improvement comprising:

controllably guiding a focused energy beam over select areas of said amorphous metallic layer; and

substantially simultaneous maintaining said substrate and said deposited metallic layer at a relatively low temperature approximately equal to said deposition temperature of said metallic layer onto said substrate whereby crystallization seeds are locally and directly formed at the beam-irradiated areas and function as a starting point for a monocrystalline front which is guided into a desired direction to form specifically-shaped crystalline or monocrystalline surfaces or lines in the amorphous metallic films.

4,372,990

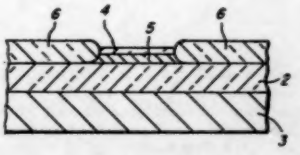
RETAINING WALL TECHNIQUE TO MAINTAIN PHYSICAL SHAPE OF MATERIAL DURING TRANSIENT RADIATION ANNEALING

Hon W. Lam, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 23, 1980, Ser. No. 161,712

Int. Cl.³ B05D 3/06

U.S. Cl. 427—53.1 8 Claims



1. A method for preparing small islands of semiconductor material for device fabrication, comprising the steps of:

depositing a layer of polysilicon on a first insulating layer which is on a substrate;
masking areas of said polysilicon layer, to become islands, with a second insulating material;
subjecting the exposed surface of said polysilicon layer to an oxidation process;
removing said second insulator material from the upper surface of said silicon islands; and
subjecting said silicon islands to transient radiation annealing.

4,372,991

COMBINATION SCRATCH FILLER AND PRIMER IN AEROSOL FORM

Stanley E. Kendall, Wilmette, Ill., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,657
Int. Cl.³ C08L *1/08, 1/18;* B32B *35/00*
U.S. Cl. 427—140 **3 Claims**

1. A combination scratch filler and primer concentrated composition for dispensing in an aerosol dispensing system consisting essentially of:

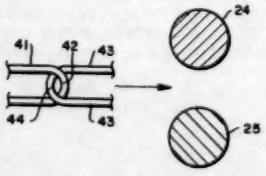
	Percent By Weight
½ Sec. RSNC 20%	25.96
Coconut Oil Alkyd	17.10
Butyl Benzyl Phthalate	2.10
Cellosolve Acetate	3.89
Methyl Ethyl Ketone	12.67
Nitropropane	1.61
Organic Calcium Bentonite	0.78
Soya Lecithin	1.55
Zinc Stearate	0.78
Titanium Dioxide	9.72
Calcium Carbonate	9.72
Magnesium Silicate	9.72
Malic Acid	2.46
Lampblack Paste-NC	1.94
	100.00

4,372,992

POLYMER COATED CHAIN LINK FENCING

Clyde A. Long, Hyattsville, Md., assignor to Sonco Wholesale Fence Inc., Bladensburg, Md.

Division of Ser. No. 123,936, Feb. 25, 1980, Pat. No. 4,305,343. This application Jul. 8, 1981, Ser. No. 281,316
Int. Cl.³ B05D *1/22*
U.S. Cl. 427—185 **1 Claim**



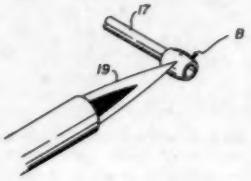
1. The method of applying a polymer coating to chain link fencing which comprises heating the chain link fencing, feeding the chain link fence into a fluidized bed dryer between sets of rollers where heated particles of the polymer adhere to the surface of the chain link fencing, the improvement comprising controlling the rate of feed of the chain link fencing to compress it, and separating the links going into said rollers whereby the polymer powder coats the portions of said links which are normally in contact.

4,372,993

METHOD FOR MAKING ENAMEL BEADS AND RESULTING PRODUCT

Michael J. Seidel, 242 NE. 169th, Portland, Oreg. 97230, and Kevin L. Dixon, Rte. 2, Box 1164K, Rosebury, Oreg. 97470

Filed Dec. 23, 1980, Ser. No. 219,525
Int. Cl.³ B05D *3/02, 3/08*
U.S. Cl. 427—193 **9 Claims**



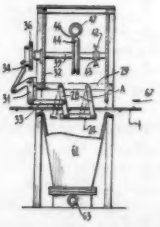
1. A method of making enamel beads comprising the steps of,
providing a tubular core member of metal,
heating said tubular core member to a glowing state,
coating the outer surface of said heated core member with an enamel flux plural times,
heating said flux coated tubular core member to a glowing state,
applying a particulate enamel material to the outer surface of said flux coated core member while in said heated state,
heating said particulate enamel material on said core member to a molten state to uniformly distribute said enamel material on said core member thereby forming a bead, and
cooling said enamel material following the formation of said bead.

4,372,994

SYNTHETIC PLASTICS COATING

Frederic D. Haig, 64 Trennerry Crescent, Abbortsford, Victoria, Australia

Filed Jan. 26, 1981, Ser. No. 228,477
Claims priority, application Australia, Jan. 24, 1980, PE2136
Int. Cl.³ B05D *1/24, 1/42*
U.S. Cl. 427—195 **12 Claims**



1. A method for coating a longitudinally extending member moving along a path with thermally responsive, synthetic plastics material comprising the steps of:
feeding the plastics material in particulate form onto a horizontal support to form a mound of material thereon;
pendulously swinging the support and mound formed thereon back and forth along the path of the member so that said support and mound have horizontal and vertical components of motion;
heating the longitudinally extending member; and
passing the longitudinally extending member through the

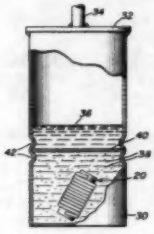
pendulously swinging mound of plastics material to coat the member with the material.

4,372,995

PROCESS OF MAKING SURFACE ALLOYED PARTS

John J. Rausch, Rte. 2, Box 177, Antioch, Ill. 60002, and Ray J. Van Thyne, 1070 Valley Lake Dr., Inverness, Ill. 60067, assignors to John J. Rausch; Ray J. Van Thyne and Material Sciences Corporation, all of Mt. Prospect, Ill.

Filed Jun. 8, 1981, Ser. No. 271,128
Int. Cl.³ C23C 1/08, 1/10
U.S. Cl. 427—300 23 Claims



1. A process of diffusing at least one predetermined element into the surface of a ferrous-based part while minimizing bonding of the part to a member which is in contact with the part during the process, comprising constructing the member of a barrier material having a composition to substantially preclude diffusion therein of the predetermined element and being capable of withstanding a molten-lead alloy bath, contacting the part with a molten alloy bath consisting essentially of lead and at least the one predetermined element, thereby to diffuse the predetermined element into the part but substantially not into the member, and separating the part from the member.

4,372,996

METHOD FOR METALLIZING ALUMINUM PADS OF AN INTEGRATED CIRCUIT CHIP

Elis A. Guditz, and Robert L. Burke, both of Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 854,101, Nov. 23, 1977, which is a continuation of Ser. No. 672,217, Mar. 31, 1976, which is a division of Ser. No. 446,865, Feb. 28, 1974, Pat. No. 3,965,277, which is a continuation-in-part of Ser. No. 251,754, May 9, 1972, abandoned. This application Sep. 7, 1979, Ser. No. 73,495
Int. Cl.³ C23C 3/00
U.S. Cl. 427—328 9 Claims

1. An immersion zinc bath comprising,

a solution containing the following components in suitable concentration for providing a bath for electroless immersion zinc metallization of aluminum,

H_2O, $ZnSO_4$, HF, Citric acid, and NH_4OH for near-neutral pH.

4,372,997

HEAT- AND FLAME-RESISTANT SHEET MATERIAL

Gary D. Fritze, Hastings, and Joseph Graham, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

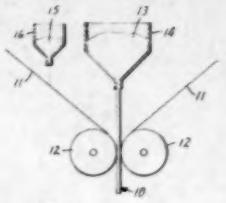
Filed Apr. 9, 1982, Ser. No. 366,822
Int. Cl.³ B32B 11/02, 11/08
U.S. Cl. 428—144 14 Claims

1. A fire- and heat-resistant sheet material comprising

at least two fibrous webs formed from a material that does not ignite or soften at temperatures lower than about 150° C.;

asphalt disposed between, impregnated in, and adhering the fibrous webs together;

inorganic filler particles dispersed in the asphalt in a volume ratio between about 1:10 and 1:1 particles to asphalt;



intumescable granules dispersed in the asphalt in an amount of at least about 5 volume-parts per 100 parts of asphalt; and

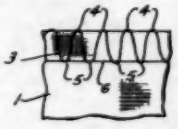
iron- and halogen-containing material dispersed in the asphalt and which catalyzes the charring of asphalt upon heating of the asphalt to 175° C. or more.

4,372,998

HEAT ADHESIVE TAPES FOR FINISHING HEMS OF TROUSERS, SKIRTS AND LIKE ARTICLES

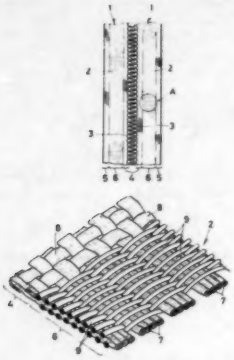
Yukio Shimada, Toyonaka, Japan, assignor to Shimada Shoji Co., Ltd., Osaka, Japan

Filed Aug. 26, 1980, Ser. No. 181,547
Int. Cl.³ B32B 23/02
U.S. Cl. 428—193 22 Claims



1. A heat adhesive tape for forming finished hems on fabric material such as trousers, skirts or the like by the application of heat, comprising a tape main body made of heat-resistant fabric, said tape main body having a heat adhesive thread of thermoplastic resin disposed in zigzag fashion, said tape main body having incorporated therein a thermoplastic resin fastening thread for fastening said heat adhesive thread to said tape main body, said fastening thread having a lower melting temperature than the melting temperature of said heat adhesive thread, said heat adhesive thread and said fastening thread being constructed and arranged such that upon application of heat thereto said fastening thread will melt first before said heat adhesive thread melts to thereby release the fastening of said heat adhesive thread to said tape main body by said fastening thread before said heat adhesive thread is subsequently melted by the continued application of said heat, said heat adhesive thread thereby melting and fusing to said fabric material to form a finished hem while substantially precluding shrinkage of said tape main body.

4,372,999
STRINGER TAPE FOR SLIDE FASTENERS
Masaharu Satoo, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Nov. 3, 1980, Ser. No. 203,327
Claims priority, application Japan, Nov. 2, 1979, 54-152837[U]
Int. Cl.³ A44B 19/34
U.S. Cl. 428—193 2 Claims

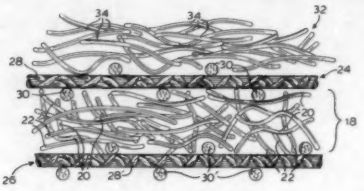


1. A stringer tape for slide fasteners, comprising: an elongate fabric woven of warp threads and sets of weft threads and including a pair of longitudinally extending, spaced first and second marginal portions and an intermediate portion extending between said first and second marginal portions, said warp threads in said intermediate portion including a plurality of thermoplastic filament yarns and being disposed against one another at their interlacings with said sets of weft threads, each said warp thread in said intermediate portion extending meanderlingly in a plane perpendicular to the general plane of said tape alternately over one of said sets of weft threads and under the next of said sets of weft threads, the topmost and undermost surfaces of said intermediate portion being defined dominantly by said thermoplastic filament yarns projecting beyond said weft threads at both said surfaces, said weft threads including a plurality of textured yarns for absorbing melted thermoplastic material, having been tensioned more highly than said warp threads in said intermediate portion while said fabric is being woven, and extending substantially straight.

4,373,000
SOFT, DRAPABLE, NONWOVEN INTERLINING FABRIC
Jürgen Knoke, Weinheim; Manfred Jöst, Hemsbach; Erich Fahrbach, and Bohuslav Tecl, both of Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany
Filed Jul. 31, 1981, Ser. No. 289,068
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038664
Int. Cl.³ B32B 27/14
U.S. Cl. 428—198 8 Claims

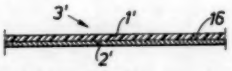
1. A nonwoven interlining fabric capable of being joined to a textile material by means of a thermally activatable adhesive on the surface of said fabric adapted to be in contact with said textile material, said fabric comprising at least two layers, each layer being comprised of staple or endless fibers in random and/or parallel arrangement and at least all less one of such layers containing thermal bonding fibers, said layers being bonded internally and to each other by means of said thermal bonding fibers to form a fabric having a facing surface adapted to be joined to said textile material, said facing surface being that of said layer having, relative to all other layers of said fabric, the lowest distribution of thermal bonding fibers, said surface having applied thereto a patterned arrangement of thermally activatable adhesive.

4,373,001
MOLDED TEXTILE AIR CONDITIONING AND HEAT DUCT
Gerald J. Smith, and Ronald W. Adams, both of Auburn, Me., assignors to Albany International Corp., Menands, N.Y.
Filed Apr. 5, 1982, Ser. No. 365,358
Int. Cl.³ B32B 7/02
U.S. Cl. 428—212 1 Claim



1. A gas-permeable, self-supporting, decorative, air conditioning and heater duct, which comprises;
a core of non-woven, synthetic textile first fibers characterized in part by a first temperature softening point, in admixture with heat softened and rehardened, synthetic, thermoplastic, textile second fibers, characterized in part by a second, lower, temperature softening point;
first and second outer layers which together sandwich the core, each of said outer layers being a fabric of heat-softened and rehardened interwoven or knitted textile yarns; and
a decorative layer of decorative non-woven staple textile fibers having a softening point temperature above the softening point temperature of the second fibers, adhered to the exposed surface of one of said first and second outer layers;
said core, first and second outer layers and decorative layer being interengaged with each other, said interengagement being of the character associated with needled fibrous fabrics;
said first fibers and said second fibers being interlocked with each other and the yarns of the first and second outer layers at points of contact by the heat softening and rehardening of the second fibers and the yarns.

4,373,002
LAMINATED MATERIAL
Peter Petersen-Hoj, Espergärde, Denmark, assignor to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland
Filed Jul. 30, 1980, Ser. No. 173,649
Claims priority, application Switzerland, Jul. 30, 1979, 7027/79
Int. Cl.³ B32B 7/02; B28D 7/02; B29C 19/00; C09T 7/02
U.S. Cl. 428—213 5 Claims



1. A heat-sealable laminated material with good tensile strength characteristics for packing purposes, said laminated material consisting of at least one layer of an orientation-stretched polyester material of predominantly crystalline molecular structure, and at least one layer of PETG material of predominantly amorphous molecular structure, said layers being joined by coextrusion and being stretched together after joining, said layer of PETG material of amorphous molecular structure being substantially thinner than the layer of polyester

material of crystalline molecular structure and forming a heat-sealable layer.

2. The laminated material in accordance with claim 1, wherein the layer of polyester material of amorphous molecular structure constitutes 1–30% of the total thickness of the laminate.

4,373,003

HIGH TEMPERATURE SILICON CARBIDE IMPREGNATED INSULATING FABRICS

Calvin Schomburg, Houston, and Robert L. Dotts, Seabrook, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 6, 1982, Ser. No. 365,950
Int. Cl.³ B32B 5/16
U.S. Cl. 428—241 10 Claims

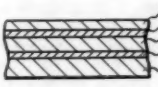
1. A high temperature insulating article comprising a fabric of closely woven heat resistant fibers having particles of silicon carbide dispersed at least partially throughout the fabric and bonded to the fibers with an emulsifiable polyethylene wax having free carboxyl groups and having a molecular weight of from about 1,500 to about 6,000 and an acid number of from about 2 to about 50.

4,373,004

LASER BEAM-RECORDING MEDIA AND METHOD FOR MANUFACTURING THE SAME

Yoshihiro Asano; Akira Morinaka, and Kei Murase, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,733
Claims priority, application Japan, Aug. 14, 1979, 54-103269; Oct. 29, 1979, 54-138761
Int. Cl.³ B32B 15/02, 17/10; G01D 15/10; B05D 3/06
U.S. Cl. 428—328 10 Claims



1. A laser beam-recording medium comprising a substrate and a plasma polymerized film containing metal particles homogeneously distributed throughout said film formed on said substrate, said plasma polymerized film being highly cross-linked, said metal particles being selected from the group consisting of Te, Bi, Ag, and In and alloys thereof, and said metal particles being in an amount of from 10 to 90 volume %.

8. A recording medium as recited in any one of claims 1, 2, 3, 4 or 5 wherein said substrate has on its upper surface, a light reflection film, a transparent layer to cause the reflection minimum to occur at the recording wavelength and said plasma polymerized film containing a metal is formed on the upper surface of said transparent layer.

4,373,005

INSULATION MATERIAL

John D. Goodwin, Vivian, La., assignor to Inventure, Inc., Shreveport, La.

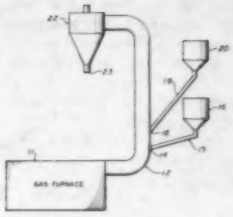
Filed May 13, 1981, Ser. No. 263,169
Int. Cl.³ B32B 19/00; C04B 43/00, 31/00
U.S. Cl. 428—357 7 Claims

1. An insulation material, which comprises:

a quantity of inorganic non-flammable fibrous material consisting of loose fibers;

and 10–75% by weight of discrete expanded silicate particles substantially homogeneously dispersed among said loose fibers throughout said fibrous material to form a substantially homogenous mixture adapted for use as a loose fill insulation material.

5. A method of making an insulation material, which comprises the steps of:



forming a substantially homogeneous mixture of a quantity of inorganic non-flammable fibrous material and a quantity of discrete unexpanded silicate particles;

and heating the mixture to a temperature sufficient to expand the silicate particles without melting said fibrous material.

4,373,006

SILICON CARBIDE COATED CARBON FIBERS AND COMPOSITES

Francis S. Galasso, Manchester, and Richard D. Veltri, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 65,296, Aug. 9, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,203
Int. Cl.³ B32B 9/00; D02G 3/00
U.S. Cl. 428—368 1 Claim

1. An electrically nonconductive fiber which comprises: a carbon fiber having a thin adherent coating consisting of silicon carbide thereon, said silicon carbide coating having a thickness of from about 0.05 to about 1 micron, said silicon carbide coating comprising less than 50% of the cross section of the coated fiber, said silicon carbide layer having on its surface a layer of silicon dioxide for enhanced electrical resistance.

4,373,007

[NON-PHOTOINITIALIO] NON-PHOTOCATALYZED DIPENTAERYTHRITOL POLYACRYLATE BASED COATING COMPOSITIONS EXHIBITING HIGH ABRASION RESISTANCE

Raymond J. Russell, Lincoln Park, N.J., assignor to Panelgraphic Corporation, West Caldwell, N.J.

Filed Nov. 3, 1980, Ser. No. 203,276
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.
Int. Cl.³ B32B 27/38; B05D 3/02; C08F 2/50
U.S. Cl. 428—412 33 Claims

1. A composition curable by actinic radiation to form an abrasion resistant product comprising a dipentaerythritol-based polyacrylate, a cellulose ester comprising the reaction product of cellulose with at least one organic carboxylic acid having from about 2 to about 4 carbon atoms or a vinyl chloride-vinyl acetate containing polymer, wherein said composition contains no photoinitiator.

9. A composition curable by actinic radiation to form an abrasion resistant product comprising dipentaerythritol pentaacrylate, a cellulose acetate butyrate containing on the average from about 15% to 50% butyryl groups, from about 1% to 30% acetyl groups and from about 1% to 5% hydroxyl groups or a partially hydrolyzed vinyl chloride-vinyl acetate copolymer containing from about 50% to 95% combined vinyl chloride monomer from about 2% to about 35% combined vinyl acetate monomer and from about 3% to about 15% combined vinyl alcohol monomer, wherein the weight ratio of said penta-

erythritol to said butyrate or copolymer is from about 6 to 1 to about 100 to 1, and wherein said composition contains no photoinitiator.

24. A method of providing an abrasion resistant coating on a substrate comprising:

(a) forming a composition curable by actinic radiation comprising a dipentaerythritol-based polyacrylate, a cellulose ester comprising the reaction product of cellulose with at least one organic carboxylic acid having from about 2 to about 4 carbon atoms or a vinyl chloride-vinyl acetate containing copolymer wherein said composition contains no photoinitiator;

(b) applying said composition to said substrate; and

(c) irradiating said composition with actinic radiation to effect curing thereof.

4,373,008

AMBIENT HYDROCURABLE COATING COMPOSITIONS

William D. Emmons, Huntingdon Valley, and Wayne E. Feely, Rydal, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 116,734, Jan. 30, 1980, Pat. No. 4,299,867. This application Nov. 9, 1981, Ser. No. 319,752

Int. Cl.³ B05D *3/02*

U.S. Cl. 428—413 **9 Claims**

8. A method for producing a cured coating, impregnating, binding or adhesive film which comprises the steps of forming a liquid film-forming composition by mixing the components

(1) a soluble addition polymer containing a plurality of pendant groups containing a 2,2-dialkyl-oxazolidine or a 2,2-cycloalkyloxazolidine group and

(2) at least one polyester obtained by the reaction of a polyol having at least two hydroxyl groups with acryloxypropionic acid or derivative thereof,

the ratio of component (2) to component (1) being in the range of 0.2 to 3.5 equivalents of unsaturated acryloxy group in component (2) per equivalent of potential secondary amine nitrogen in component (1), applying the composition to at least one surface of a substrate to be coated at ambient conditions of temperatures and relative humidity to deposit a film coating the surface of, or impregnating any pores or interstitial openings extending into the substrate, and then curing the film by exposure to ambient conditions of temperature and relative humidity.

9. An article produced by the method according to claim 8.

4,373,009

METHOD OF FORMING A HYDROPHILIC COATING ON A SUBSTRATE

R. Alastair Winn, Santa Barbara, Calif., assignor to International Silicone Corporation, San Diego, Calif.

Filed May 18, 1981, Ser. No. 264,957

Int. Cl.³ A61M *25/00*

U.S. Cl. 428—424.2 **56 Claims**

1. The method of bonding a hydrophilic coating to the surface of a biomedical substrate comprising:

applying a coating from a solvent solution comprised of a polyisocyanate to the surface of said substrate to form a coupling coating with unreacted isocyanates;

applying a solvent solution comprised of a hydrophilic copolymer made from monomers of vinylpyrollidone and monomers containing active hydrogen which will react with isocyanate to form a covalent bond between said coupling coating and said hydrophilic copolymer;

evaporating the solvent and reacting said isocyanates.

4,373,010

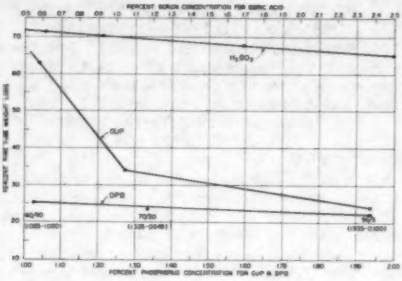
NON-RESINOUS, UNCURED TIRE RETARDANT AND PRODUCTS PRODUCED THEREWITH

William J. Oberley, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 14, 1980, Ser. No. 196,540

Int. Cl.³ B32B *23/04, 29/00*

U.S. Cl. 428—532 **34 Claims**



1. A synergistic fire retardant composition useful for treating cellulosic materials consisting essentially of the partial reaction product of dicyandiamide, phosphoric acid, boric acid and water wherein prior to reaction the mole ratio of dicyandiamide to phosphoric acid is from 1.0 to about 0.8–1.2 and the mole ratio of boric acid to combined dicyandiamide and phosphoric acid is from about 0.2–1.5 to 1.0.

19. A cellulosic material impregnated with a fire retardant amount of the synergistic fire retardant composition of claim 1.

4,373,011

BLENDS OF ALGIN, TAMARIND, AND A POLYCATIONIC ELECTROCONDUCTIVE POLYMER

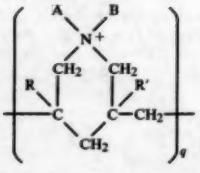
Robert I. Yin, LaJolla, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

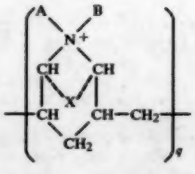
Continuation-in-part of Ser. No. 169,578, Jul. 17, 1980, abandoned. This application May 29, 1981, Ser. No. 268,525

Int. Cl.³ B32B *21/04*

U.S. Cl. 428—537 **3 Claims**

1. An aqueous solution comprising 0.4% of a blend of tamarind kernal powder and sodium alginate (4:1 weight ratio) and 12% of a polycationic, electroconductive, linear chain, repeating ring polymer having quaternary ammonium salt groups on the backbone said polymer being a homopolymeric molecular chain of repeating units of a formula selected from the group consisting of:





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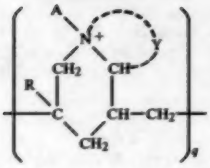
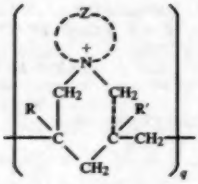


and



said polymer having an intrinsic viscosity in 0.1 N potassium chloride of at least between about 0.5 and 2.0, and wherein

A and B independently represent a member selected from the class consisting of alkyl and phenyl radicals on which any substituents are selected from the group consisting of hydroxy, amido, carboloweralkoxy, loweralkoxy, phenoxy, naphthoxy, cyano, thioloweralkoxy, thiophenoxy, loweralkoyl, 5- and 6-membered cycloalkyl, tri-(loweralkyl)ammoniumloweralkyl, with, on the alkyl groupings only, a nitro group, and, on the phenyl radicals only, a halogen atom; and, taken together, A and B represents a member selected from the group consisting of

$$-CH_2-CH_2-,$$
$$-CH(CH_3)-CH(CH_3)-CH=CH-CH=CH-,\ -CH=CH-CH=N-$$

and

$$-CH=CH-N=CH-$$

R and R' independently represent a member selected from the class consisting of hydrogen, chloro, bromo, loweralkyl, and phenyl radicals;

X represents a divalent radical of the formula

$$-CH_2-(O)_n-(CH_2)_m-$$

Y represents a divalent radical of the formula

$$-(CH_2)_p-(O)_n-CH_2-$$

Z represents a divalent radical of the formula

$$-(CH_2)_p-(O)_n-(CH_2)_2-$$

and

n is one of the numbers 0 and 1;

m is one of the numbers 1 and 2;

p is one of the numbers 2 and 3 and the symbol Q is an integer representing the number of units in the molecular chain.

4,373,012

CASINGS AND PRESSED PARTS UTILIZED FOR THE EXTRUSION OF ARTICLES, PARTICULARLY PIPES, AND MANUFACTURING PROCESS OF SUCH CASINGS AND PRESSED PARTS

Christer Aslund; Hans Eriksson, and Claes Torsberg, all of Torshälla, Sweden, assignors to Granges Nyby AB, Nybybruk, Sweden

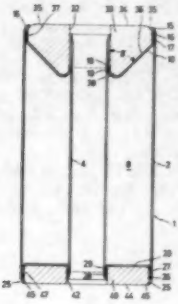
PCT No. PCT/EP79/00084, § 371 Date Jun. 26, 1980, § 102(e) Date Jun. 26, 1980, PCT Pub. No. WO80/00084, PCT Pub. Date May 1, 1980

PCT Filed Oct. 26, 1979, Ser. No. 195,610

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846658; Oct. 26, 1978, 2846659

Int. Cl.³ B22F 3/00

U.S. Cl. 428—558 21 Claims



1. A capsule having an annular transverse cross section for isostatically producing a pressing for use in the extrusion of dense metallic tubes, said capsule comprising a tubular thin-walled sheet metal container to be filled with a powder and having plug-like inserts for closing each of its opposite ends, wherein at least the insert at the front end of the capsule is formed of ductile material, has a generally annular shape with a central bore, is provided with a substantially flat end face at the front end of the capsule, and has an external diameter which decreases rearwardly from a point of maximum external diameter to a wall defining said central bore, and wherein at least the outer wall of the thin-walled sheet metal container has substantially the same strength properties in the axial direction along its entire circumference.

4,373,013

ELECTROCONDUCTIVE POWDER AND PROCESS FOR PRODUCTION THEREOF

Motohiko Yoshizumi, Urawa, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,555

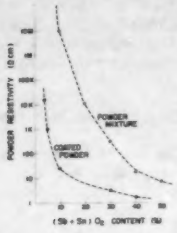
Claims priority, application Japan, Sep. 14, 1979, 54-117342; Feb. 13, 1980, 55-16217; Jun. 23, 1980, 55-84997

Int. Cl.³ B22F 3/00

U.S. Cl. 428—570 6 Claims

1. Electroconductive powder consisting essentially of titanium oxide particles and a coating layer of a mixture of antimony oxide and tin oxide provided on the surfaces of the titanium oxide particles, wherein said titanium oxide particles

have a rutile crystalline structure, a purity of at least 98 percent, and a specific surface area of 1 to 20 meter^2/gram, and



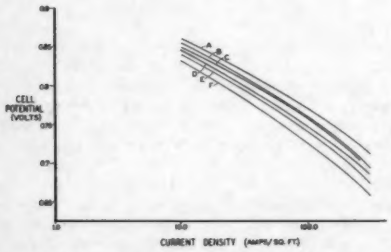
said coating layer has a thickness of 0.001 to 0.07 μm and contains 0.1 to 30 percent by weight of antimony.

4,373,014

PROCESS USING NOBLE METAL-CHROMIUM ALLOY CATALYSTS IN AN ELECTROCHEMICAL CELL

Douglas A. Landsman, West Hartford, and Francis J. Luczak, Galstonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 160,517, Jun. 18, 1980, Pat. No. 4,316,944.
This application Jun. 29, 1981, Ser. No. 278,249
Int. Cl.^{3} H01M *8/00*
U.S. Cl. 429—13 3 Claims



1. A process in an electrochemical cell involving catalytically reducing oxygen, the step of catalytically reducing oxygen using a catalyst comprising a platinum-chromium alloy, said alloy having a catalytic activity for the reduction of oxygen at least twice that of the platinum in unalloyed form wherein the surface area of the platinum in the alloy is at least 30 m^2/g.

4,373,015

ELECTRIC STORAGE BATTERIES

Kenneth Peters, Worsley, and Barry Culpin, Bolton, both of England, assignors to Chloride Group Limited, London, England

PCT No. PCT/GB80/00081, § 371 Date Jan. 9, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02471, PCT Pub. Date Nov. 13, 1980
PCT Filed Apr. 25, 1980, Ser. No. 229,565
Claims priority, application United Kingdom, May 9, 1979, 7916119
Int. Cl.^{3} H01M *10/06*
U.S. Cl. 429—57 9 Claims

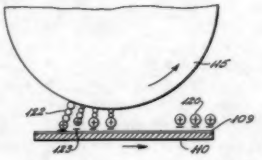
1. A recombinant lead acid electric storage battery in which the positive and negative plates in each cell are separated by separators of electrolyte and gas permeable compressible fibrous separator material comprising organic polymeric fibers having diameters ranging from 0.01 μm or less up to 10 μm with an average diameter of less than 10 μm, the weight to fiber density ratio being at least 20, said separator being compressed between said plates and the separator material having a wicking height of at least 5 cms and an electrolyte absorption ratio of at least 100 percent, wherein the electrolyte volume (E) in the battery is at least 0.8(X+Y), where X is the total pore volume of the separators in the dry state and Y is the total pore volume of the positive and negative active materials in the dry fully charged state and wherein the battery at least when fully charged has substantially no free unabsorbed electrolyte whereby substantial oxygen gas recombination occurs in the battery at charging rates not in excess of C/20.

4,373,016

PROCESS OF TRANSFERRING MONOCOMPONENT DEVELOPING POWDER WITH A VOLATILE, DIELECTRIC LIQUID

Donald H. M. Kings, St. Nicolas D'Aliermont; Jean-Claude Marckmann, Arques la Bataille, and Pham K. Quang, Dieppe, all of France, assignors to Rhone-Poulenc Systemes, Paris, France

Filed May 12, 1981, Ser. No. 262,827
Claims priority, application France, May 12, 1980, 80 10611
Int. Cl.^{3} G03G *13/16*
U.S. Cl. 430—126 19 Claims



1. A process of electrographic reproduction comprising the steps of:

(a) Forming an image of electrostatic charges on a temporary support,

(b) Developing the image with a dry, conductive monocomponent developing powder in which a charge of either polarity is induced by the image of electrostatic charges to form a powder image, and

(c) Transferring the powder image to an arbitrary support having deposited thereon a volatile dielectric liquid having a volume resistivity of greater than $10^3\Omega cm^2/cm$, said volatile dielectric liquid not capable of readily dissolving the resins in the developing powder, the arbitrary support or the temporary support.

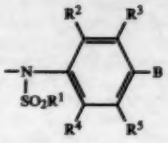
4,373,017

PHOTOSENSITIVE COMPOUND AND PHOTOSENSITIVE MATERIAL CONTAINING IT

Toyoaki Masukawa, Hino; Wataru Ishikawa, Hachioji; Kenichiro Okaniwa, and Kiyoshi Yamashita, both of Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Mar. 5, 1981, Ser. No. 240,912
Claims priority, application Japan, Mar. 5, 1980, 55-28530; Sep. 5, 1980, 55-123325
Int. Cl.^{3} G03C *1/68, 1/52*
U.S. Cl. 430—270 14 Claims

1. A photosensitive material having a photosensitive layer provided on a support which photosensitive layer comprises a photosensitive compound which forms a color dye directly under irradiation of ultraviolet rays, said compound being represented by the formula [i]:



[i]

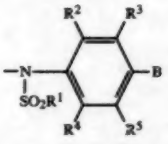
wherein [COUP] represent a 4-equivalent yellow, magenta or cyan coupler from which a hydrogen is removed at a coupling position thereof, B is a hydroxy group or

wherein R^6 and R^7 are individually an alkyl group or they may form a 1-piperidino, 1-piperazino, 1-pyrolidino or 4-morpholino group together with each other,

R^1 is an alkyl, aryl, alkylamino or arylamino group, and

R^2, R^3, R^4 and R^5 individually are a hydrogen or halogen atom or aliphatic or aromatic group, or R^2 and R^3 may be fused to form a naphthalene ring.

8. A photosensitive presensitized printing plate having a photosensitive resin layer provided on a support which contains a photosensitive compound which forms a color dye directly under irradiation of ultraviolet rays, said compound being represented by the formula [i]:



[i]

wherein [COUP] represent a 4-equivalent yellow, magenta or cyan coupler from which a hydrogen is removed at a coupling position thereof, B is a hydroxy group or

wherein R^6 and R^7 are individually an alkyl group or they may form a 1-piperidino, 1-piperazino, 1-pyrolidino or 4-morpholino group together with each other,

R^1 is an alkyl, aryl, alkylamino or arylamino group, R^2, R^3, R^4 and R^5 individually are a hydrogen or halogen atom or aliphatic or aromatic group.

4,373,018

MULTIPLE EXPOSURE MICROLITHOGRAPHY PATTERNING METHOD

Elsa Reichmanis, Piscataway; Bernard J. Roman, Summit; King L. Tai, Berkeley Heights, and Cletus W. Wilkins, Jr., Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1981, Ser. No. 270,792

Int. Cl.³ G03C *5/00, 1/76*

U.S. Cl. 430—312 **6 Claims**

1. Method for making an article, said method comprising patterning a surface by alteration of at least one selected portion of said surface, patterning comprising

depositing on said surface a first layer which consists essentially of an organic radiation-sensitive material,

depositing on said first layer a second layer which consists essentially of silver-sensitized germanium-selenium,

exposing at least one area of said second layer to first actinic radiation so as to define a pattern in said second layer,

developing said pattern in said second layer by removal either of said area of said second layer or of a domain of said second layer which is complementary to said area of said second layer so as to expose at least one region of said first layer,

exposing at least said region of said first layer to second actinic radiation so as to replicate said pattern in said first layer,

developing said pattern in said second layer by removal of said area or domain of said first layer so as to expose said selected portion of said surface, and

altering said selected portion of said surface by exposure to a fabrication agent.

4,373,019

THICK FILM FINE PATTERN FORMING METHOD

Yutaka Watanabe, Machida, and Hisayasu Matsuo, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

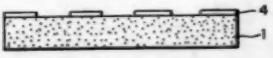
PCT No. PCT/JP79/00228, § 371 Date Apr. 31, 1980, § 102(e) Date Apr. 9, 1980, PCT Pub. No. WO80/00520, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 28, 1979, Ser. No. 201,023

Claims priority, application Japan, Aug. 31, 1978, 53-106665

Int. Cl.³ H05K *3/02*

U.S. Cl. 430—317 **3 Claims**



1. A method of forming a thick film fine pattern on a substrate, comprising the steps of:

coating the surface of the substrate with a thermoplastic resin bonding layer;

coating said bonding layer with a thick film circuit forming paste including an organic solvent;

drying the paste;

coating the dried paste with water soluble photoresist;

exposing a pattern onto the photo-resist;

developing the photo-resist to expose portions of the paste;

eliminating the exposed paste; and

baking the substrate.

4,373,020

DECOLORIZABLE IMAGING SYSTEM

John M. Winslow, South Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 199,426, Oct. 22, 1980, Pat. No. 4,336,323, which is a continuation-in-part of Ser. No. 101,144, Dec. 7, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,357

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ G03C *1/72*

U.S. Cl. 430—339 **12 Claims**

1. An imageable layer comprising a polymeric binder, and within said binder (1) a dye, (2) an acid, and (3) a nitrate salt, said dye being present in said binder in sufficient concentration to provide an optical density of at least 0.1 in the visible region of the electromagnetic spectrum or to absorb at least 20% of incident radiation in a 50 nm range within the infrared or ultraviolet wavelengths of the electromagnetic spectrum, said nitrate ion being present in a ratio of at least 0.1 moles/mole of dye, said nitrate salt in said binder being capable of liberating a sufficient quantity of an oxidizing agent selected from the

class consisting of HNO_3, NO, NO_2, and N_2O_4 when heated to 200° C. for 60 seconds to oxidize said dye to a different color or colorless state, and the acid is present as from 0.01 to 50 times the molar amount of nitrate.

4,373,021

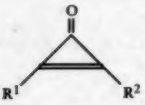
INDOLIZINONE DYES AND COMPOSITIONS, ELEMENTS AND METHODS USING SAME

George L. Fletcher, Pittsford, and Donald H. Wadsworth, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

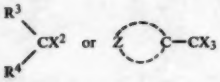
Filed Jun. 29, 1981, Ser. No. 278,023
Int. Cl.³ G03C 5/24
U.S. Cl. 430—374 7 Claims

1. An imaging element reactable with pyridine to form a dye image, said element comprising:

a support having thereon a composition comprising a photodecomposable mixture of a cyclopropenone having the structure



and either



2a 2b

wherein

R^1 and R^2 are individually alkyl of 1 to 5 carbon atoms, aryl of 6 to 10 carbon atoms, or a heterocyclic group of from 5 to 6 nuclear atoms selected from the group consisting of carbon, oxygen, and sulfur;

R^3 is selected from the group consisting of aryl of 6 to 10 nuclear carbon atoms and bearing a bathochromic substituent; nitro; carbonyl; amide; sulfonyl; and cyano;

R^4 is hydrogen, alkyl of 1 to 5 carbon atoms halogen, or one of the group of R^3;

X is halogen; and,

Z represents the non-metallic atoms necessary to complete one, two or three fused rings of 5 to 14 nuclear atoms selected from the group consisting of carbon and nitrogen.

4,373,022

METHOD AND APPARATUS FOR PRODUCING A HIGH SPEED HIGH RESOLUTION RADIATION SENSITIVE ARTICLE AND A HIGH SPEED HIGH RESOLUTION RADIATION SENSITIVE ARTICLE

Arnold Hoffman, 6 Hagra St., Rehovot, Israel, and Shmuel Engelstein, Rehovot, Israel, assignors to Arnold Hoffman, Rehovot, Israel

Filed Dec. 27, 1979, Ser. No. 107,559
Claims priority, application Israel, Dec. 28, 1978, 56324
Int. Cl.³ G03C 1/76, 3/00
U.S. Cl. 430—434 13 Claims

1. A method for producing a high resolution high speed photographic black and white image comprising the steps of:

preparing radiation sensitive material having relatively large and relatively small grains of silver halide;

arranging the silver halide grains so as to permit the large and small grains to be developed under independent development conditions;

exposing the radiation sensitive material; and

chemically developing the large grains with one chemical developer and independently developing the small grains with another chemical developer, so as to develop both the large and small grains.

5. In a photographic negative film comprising at least one transparent impermeable support and a coating of silver halide particles on said at least one support, the improvement wherein

two populations of said silver halide particles are provided, one said population comprising relatively small grains on one side of said support and another said population comprising relatively large grains on the other side of said support, the difference in the sizes of said relatively small and large grains being at least 10%, and the photographic speeds of said small and large grains differing from one another by not more than three stops;

said two populations of silver halide particles being located on said at least one support for simultaneous exposure; and

said film including said impermeable support to inhibit diffusion of chemical developers therethrough, and comprising means to provide fully independent chemical development for each of said two populations of silver halide particles wherein said two populations are separated from one another by said support so as to prevent chemical developer for one said population from contacting the other said population, whereby superimposed negative images are provided.

4,373,023

PROCESS FOR NEUTRALIZING HEPARIN

Robert S. Langer, Cambridge; Robert Linhardt, Somerville; Charles L. Cooney, Brookline; Parrish M. Galliher, West Newton; Margaret M. Flanagan, Somerset, all of Mass., and Michael D. Klein, Ann Arbor, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 14, 1980, Ser. No. 196,720
Int. Cl.³ A01N 1/02; A61K 35/14
U.S. Cl. 435—2 5 Claims

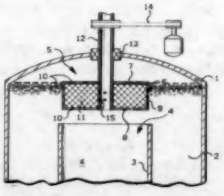
1. In the process for treating the blood of a patient extracorporeally wherein heparin is introduced into the blood to substantially prevent blood coagulation, the improvement which comprises passing said treated blood containing heparin into contact with an immobilized heparinase, said heparinase being derived from *Flavobacterium heparinum*, in order to deactivate said heparin prior to reintroducing said treated blood into the patient.

4,373,024

APPARATUS USEFUL FOR FOAM BREAKING

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1980, Ser. No. 212,187
Int. Cl.³ B01D 19/02
U.S. Cl. 435—41 10 Claims



8. In a fermentation process comprising

(a) subjecting a mixture comprising a nutrient medium and a microorganism to fermentation conditions,

(b) generating a foam comprising a liquid phase of nutrient and microorganism cells and a gaseous phase,

(c) passing said foam to a foam breaking operation thus separating said foam into said liquid phase and said gas phase by passing the foam into contact with rapidly rotating surfaces, the improvement comprising

using as said surfaces, paths defining surfaces formed in a foam breaking body by a multitude of packing material elements that are in contact with each other and that are shaped and arranged such as to form a large number of fluid paths between an outer and an inner surface of said body, said paths having an average diameter in the range of 0.04 to 1 inch,

generating a pressure gradient between said outer and said inner surfaces of said body thus forcing said foam to move into contact with the outer surface of said rotating body and into said paths,

withdrawing said gas phase from the inner surface of said body.

4,373,025

PROCESS FOR THE ISOMERIZATION OF GLUCOSE

Richard W. Neuzil, Downers Grove, and James W. Priegnitz, Elgin, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 973,298, Dec. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 690,769, May 27, 1976, abandoned. This application Nov. 3, 1980, Ser. No. 203,786

Int. Cl.³ C12P *19/24*

U.S. Cl. 435—94 **7 Claims**

1. A process for the isomerization of glucose into fructose and recovery of said fructose which comprises first contacting an aqueous glucose solution with a glucose isomerase in an isomerization zone having an isomerization effluent stream to isomerize at least a portion of said glucose into fructose and to form said isomerization zone effluent stream comprising glucose and an increased quantity of fructose and then:

(a) contacting said isomerization effluent stream in a separation zone maintained at a temperature in the range of from 20° C. to 200° C. and a pressure in the range of from atmospheric to 500 psig with an adsorbent consisting essentially of an X zeolite containing potassium cations at exchangeable cationic sites to selectively adsorb said glucose;

(b) removing from said adsobent a raffinate stream selectively rich in fructose;

(c) contacting said adsorbent at a temperature and pressure within said ranges of step (a) with a desorbent material to desorb said adsorbed glucose from said adsorbent and thereby form a glucose extract stream; and,

(d) removing from said adsorbent an extract stream selectively rich in glucose.

4,373,026

MICROBIAL POLYAMIDE OXIDASE PC-3 AND PROCESS FOR PREPARATION THEREOF

Hideaki Yamada; Yoshiki Tani, and Kimiyasu Isobe, all of Kyoto, Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Filed Dec. 12, 1980, Ser. No. 216,302

Claims priority, application Japan, Dec. 24, 1979, 54-166953

Int. Cl.³ C12R *1/82*; C12N *9/06*; C12P *21/00*

U.S. Cl. 435—191 **5 Claims**

1. Microbial polyamine oxidase PC-3 having the following physicochemical properties:

(1) Reactivity:
it reacts with spermidine to form 1 mol of putrescine, 1 mol of 3-aminopropionaldehyde and 1 mol of hydrogen peroxide from 1 mol of spermidine and it reacts with spermine to form 1 mol of putrescine, 2 mol of 3-aminopropionaldehyde and 2 mols of hydrogen peroxide from 1 mol of spermine;

(2) Substrate specificity:
it reacts with spermidine and spermine, but it does not react with other amines;

(3) Optimum pH value:
the optimum pH for reaction with spermidine is about 5.0 and the optimum pH for reaction with spermine is about 9.5;

(4) pH Stability:
when it is treated at 30° C. for 10 minutes, the residual ratio of the activity with either spermidine or spermine as the substrate at a pH from 3.0 to 5.0 is higher than 85%;

(5) Optimum temperature:
when spermidine is a substrate, the optimum temperature is about 25° C. at a pH of 6.5 and when spermine is a substrate, the optimum temperature is about 35° C. at a pH of 6.5 and is about 40° C. at a pH of 7.0;

(6) Temperature stability:
in the case where spermine is a substrate, when it is treated at 35° C. for 10 minutes at a pH of 4.0, the residual ratio of the activity is higher than 95%, and if it is treated at 20° C. for 10 minutes at a pH of 7.0, the residual ratio of the activity is higher than 85%;

(7) Absorption spectrum and coenzyme:
from the fact that maximum absorptions are observed at 375 nm and 450 nm in the absorption spectrum, it is confirmed that the oxidase is a flavin protein, and FAD is present as a coenzyme in an amount of 2 molecules per molecule of the oxidase;

(8) Influences of inhibitors and metal ions:
in the case where spermine is a substrate, the activity is inhibited by PCMB, monoiodoacetic acid, a silver ion and a mercury ion, and in the case where spermidine is a substrate, the activity is inhibited by a silver ion and an aluminum ion;

(9) Isoelectric point:
the isoelectric point is 5.4 to 5.6;

(10) Molecular weight:
the molecular weight is 160,000 as determined according to the gel filtration method using Sephadex G-200;

(11) Molecular weight of Subunit:
the molecular weight of the subunit is 80,000 as determined according to the SDS disc electrophoresis method; and

(12) Crystal form:
it takes the form of a needle crystal.

2. A process for the preparation of microbial polyamine oxidase having the following physicochemical properties:

(1) Reactivity:
it reacts with spermidine to form 1 mol of putrescine, 1 mol of 3-aminopropionaldehyde and 1 mol of hydrogen peroxide from 1 mol of spermidine and it reacts with spermine to form 1 mol of putrescine, 2 mol of 30 aminopropionaldehyde and 2 mols of hydrogen peroxide from 1 mol of spermine;

(2) Substrate specificity:
it reacts with spermidine and spermine, but it does not react with other amines;

(3) Optimum pH value:
the optimum pH for reaction with spermidine is about 5.0 and the optimum pH for reaction with spermine is about 9.5;

(4) pH Stability:
when it is treated at 30° C. for 10 minutes, the residual ratio of the activity with either spermidine or spermine as the substrate at a pH from 3.0 to 5.0 is higher than 85%;

(5) Optimum temperature:
when spermidine is a substrate, the optimum temperature is about 25° C. at a pH of 6.5 and when spermine is a substrate, the optimum temperature is about 35° C. at a pH of 6.5 and is about 40° C. at a pH of 7.0;

(6) Temperature stability:
in the case where spermine is a substrate, when it is treated at 35° C. for 10 minutes at a pH of 4.0, the residual ratio of the activity is higher than 95%, and if it is treated at 20° C. for 10 minutes at a pH of 7.0, the residual ratio of the activity is higher than 85%;

(7) Absorption spectrum and coenzyme:
from the fact that maximum absorptions are observed at 375 nm and 450 nm in the absorption spectrum, it is confirmed that the oxidase is a flavin protein, and FAD is present as a coenzyme in an amount of 2 molecules per molecule of the oxidase;

(8) Influence of inhibitors and metal ions:
in the case where spermine is a substrate, the activity is inhibited by PCMB, monoiodoacetic acid, a silver ion and a mercury ion, and in the case where spermidine is a substrate, the activity is inhibited by a silver ion and aluminum ion;
(9) Isoelectric point:
the isoelectric point is 5.4 to 5.6;
(10) Molecular weight:
the molecular weight is 160,000 as determined according to the gel filtration method using Sephadex G-200;
(11) Molecular weight of Subunit:
the molecular weight of the subunit is 80,000 as determined according to the SDS disc electrophoresis method; and
(12) Crystal form:
it takes the form of a needle crystal, which comprises, culturing a strain of the genus penicillium producing said oxidase in a nutrient culture medium containing spermidine or spermine under conditions sufficient to accumulate said oxidase and recovering the oxidase.

4,373,027
MICROPARTICLES, PREPARATION THEREOF AND APPLICATIONS THEREOF IN BIOLOGY, PARTICULARLY IN THE CULTURE OF HUMAN DIPLOID CELLS

Armand Berneman, 11, Rue de Crussol, 75011 Paris; Alain David, Rue de Rollet-Cuise la Motte, 60350 Berneuil sur Aisne; Florian Horaud, 2, rue Albert de Mun, 92190 Meudon, and Emile Segard, Village du Parc Rimbertlieu-Villers sur Coudun, 60150 Thourotte, all of France

Filed Dec. 5, 1980, Ser. No. 213,314
Claims priority, application France, Dec. 5, 1979, 79 29910
Int. Cl.³ C12N *5/00, 5/02;* C12M *3/00, 3/04*
U.S. Cl. 435—240 **48 Claims**

1. Microparticles comprising particles or beads whose surface at least is formed from a reticulated protein, chosen from protein capable of forming a visco-elastic mass which after reticulation has a fibrous-type structure in a mesh network configuration.

4,373,028
CULTURE OF NOCARDIA ATCC 31309

Eiji Higashide, Takarazuka; Seiichi Tanida, Kyoto; Masayuki Muroi, Suita, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Division of Ser. No. 930,317, Aug. 2, 1978, Pat. No. 4,298,600. This application Jul. 14, 1981, Ser. No. 283,544
Claims priority, application Japan, Aug. 4, 1977, 52-93875
Int. Cl.³ C12N *1/20*
U.S. Cl. 435—253 **1 Claim**

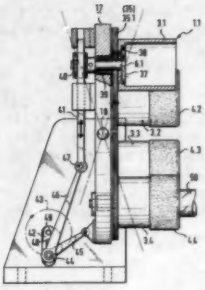
1. A biologically pure culture of the microorganism belonging to the genus Nocardia having the characteristics identifiable with those of ATCC-31309, said culture being capable of producing in a culture medium containing assimilable carbon and digestible nitrogen sources, a recoverable amount of Antibiotic C-14482 A_1.

4,373,029
DEVICE FOR CULTIVATION OF MATRIX-BOUND BIOLOGIC CELL SYSTEMS

Stephan Nees, Waldwiesenstrasse 30b, 8000 Munich 70, Fed. Rep. of Germany

Filed Aug. 21, 1980, Ser. No. 180,035
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934328
Int. Cl.³ C12M *3/02, 3/00;* B01F *11/00, 9/00*
U.S. Cl. 435—286 **13 Claims**

1. Apparatus for the cultivation of matrix-bound biologic cell systems on microcarrier particulates suspended in a nutrient medium comprising
a housing member having a longitudinal axis,
a culture vessel for containing said culture bearing microcarrier particulates in a nutrient medium removably insertable into said housing,
means for pivotally displacing said housing member and contained culture vessel through predetermined arcs in the vertical plane on either side of a reference base wherein said longitudinal axis of said housing member is disposed horizontal to ground,



means for rotatably displacing said housing member and contained culture vessel through a predetermined arc about said longitudinal axis in alternating clockwise and counterclockwise directions simultaneous with said pivotal displacement thereof.

4,373,030
POLYCRYSTALLINE TRANSLUCENT ALUMINA SINTERED BODY, A METHOD FOR PRODUCING THE SAME AND A HIGH PRESSURE VAPOR DISCHARGE LAMP OBTAINED BY USING SAID SINTERED BODY

Masayuki Kaneno, Tokoname, and Takehiro Kajihara, Komaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 5, 1981, Ser. No. 260,758
Claims priority, application Japan, May 15, 1980, 55/63312
Int. Cl.³ H01J *17/16;* C04B *35/10, 35/50*
U.S. Cl. 501—152 **2 Claims**

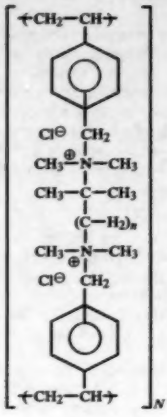
1. A polycrystalline translucent alumina sintered body in which the content of MgO is 0.001–0.04% by weight, the content of each of La_2O_3 and Y_2O_3 is 0.001–0.01% by weight, a weight ratio of $MgO/La_2O_3+Y_2O_3$ is 0.5–2, and an in-line transmission is more than 40%.

4,373,031
SYNTHESIS OF ANION EXCHANGE POLYMERS EMPLOYING DITERTIARY AMINES

Warren A. Waite, Burlington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Sep. 25, 1980, Ser. No. 190,787
Int. Cl.³ B01J *41/04*
U.S. Cl. 521—32 **9 Claims**

1. An ion-exchange, cross-linked, polymeric structure comprised essentially of a plurality of recurring units of the formula:



wherein n is 1.

4,373,032

METAL SALTS OF POLYACETYLENIC COMPOUNDS AND USES THEREOF AS ION EXCHANGE AND THERMOCHROMIC POLYMERS

Anthony F. Preziosi, Ledgewood; Gordhanbhai N. Patel, Morris Plains; Robert G. Denkewalter, Westfield, and Ray H. Baughman, Morris Plains, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 16, 1980, Ser. No. 159,741
Int. Cl.³ C08F 38/02; B01J 39/20; C08F 2/46
U.S. Cl. 521—38 12 Claims

1. A polymeric compound prepared by the 1,4 addition of a diacetylenic monomer of the formula $[R(C{=}C)_a(CH_2)_b(C{=}C)_{b-1}]_2$ wherein a is 1 or 2 and b is 0 when a is 1; b is 0, 1, or 2 when a is 2 and (b − 1) is taken as zero whenever b is zero; wherein R is selected from the group consisting of (I): $-(CH_2)_nO(C{=}O)NHCH_2CO_2M$, n being an integer from 1 to 10 and M representing an alkali metal or hydrogen; and (II): $-(CH_2)_{n'}CO_2M'$, n′ being an integer from 0 to 9 and M′ being an alkali metal with the proviso that when a is 1, n′ is an integer from 0 to 4.

4,373,033

BLENDED PLASTOMERIC AND ELASTOMERIC RUBBER LATEX SPONGE

Ramesh K. Gupta, Toronto, Canada, assignor to Clarex Manufacturing Limited, Weston, Canada

Continuation of Ser. No. 171,910, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 935,231, Aug. 21, 1978, abandoned. This application Aug. 3, 1981, Ser. No. 289,214
Claims priority, application Canada, Apr. 11, 1978, 300917
Int. Cl.³ C08V 9/30
U.S. Cl. 521—70 10 Claims

1. A frothed sponge rubber having a density between 2 and 20 pounds per cubic foot of blended natural and synthetic elastomeric latices and synthetic plastomeric latex characterised in containing more than 5 parts by weight styrene on a dry solids weight basis and in exhibiting high compressive deflection of more than about 1 psi and low compressive set of less than about 20% which comprises, by weight:

about 90–50 parts of base elastomeric latex solids selected from the group consisting of (1) homopolymers of butadiene; (2) homopolymers of isoprene; (3) copolymers of butadiene and styrene having less styrene content than butadiene content; (4) copolymers of butadiene and acrylonitrile; (5) copolymers of isoprene and styrene; (6) copolymers of butadiene, styrene and an unsaturated carboxylic acid; (7) homopolymers of chloroprene; and (8) natural rubber;

about 5–25 parts of augmenting plastomeric latex solids, selected from the group consisting of styrene-butadiene copolymers having a styrene content of at least 70% by weight, acrylic latices and vinyl latices, and exhibiting stiffening as defined under ASTM D 833-65T;

and about 5–25 parts of augmenting elastomeric latex solids, the augmenting elastomeric solids being chemically different from the base elastomeric latex solids and being elastomers within the definition of ASTM D 833-65T when cured, at least one of said base elastomeric latex solids and said augmenting elastomeric latex solids containing natural rubber latex,

wherein said frothed sponge rubber is produced by a no-gel method.

4,373,034

MODIFICATION OF POLYOLS WITH EPOXY RESINS FOR USE IN FLEXIBLE POLYURETHANE FOAMS

George P. Speranza; Michael Cuscurida, and Robert L. Zimmerman, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 183,543, Sep. 2, 1980, Pat. No. 4,316,991. This application Jul. 27, 1981, Ser. No. 286,786
Int. Cl.³ C08G 18/14, 18/48
U.S. Cl. 521—177 12 Claims

1. A method for producing a flexible polyrethane foam which comprises:

(a) making a modified polyol by reacting an initiator having an active hydrogen functionality of from 3 to 4, one or more alkylene oxides and an epoxy resin in such a manner that the epoxy resin is added internally along the length of the polyol chain, and

(b) reacting said modified polyol with an organic polyisocyanate and one or more suitable foam catalysts in the presence of a blowing agent.

4,373,035

ISOTONIC MONOMER FORMULATIONS

Rafael L. Bowen, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,067
Int. Cl.³ C08L 33/14
U.S. Cl. 523—113 20 Claims

1. A composition of matter comprising a solution, substantially isotonic with normal physiological saline solution, of water in water-stable ethylenically unsaturated monomers.

4,373,036

DENTURE FIXATIVE COMPOSITION

Tiang-Shing Chang, Westfield; Lucy J. Zientek, Bayonne; Arthur Viningauz, Irvington, and Marcy L. Scheps, Perth Amboy, all of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Filed Dec. 21, 1981, Ser. No. 332,890
Int. Cl.³ C09J 3/04
U.S. Cl. 523—120 16 Claims

1. A denture fixative composition comprising a dentally acceptable excipient and an effective fixative amount of a fixative mixture comprising hydroxypropylcellulose and (a) polyacrylic acid partially neutralized by at least one dentally acceptable monovalent cation such that about 20–90% of the initial carboxy groups have been neutralized and 0–80% of the initial carboxy groups have been crosslinked by at least one dentally acceptable agent selected from the group consisting of divalent cations and polyhydroxy compounds, wherein a 1% aqueous solution of said polyacrylic acid has a pH of at least about 4.5, or a precursor combination of polyacrylic acid, neutralizing agent and crosslinking agent adapted to form said

polyacrylic acid in an aqueous environment; (b) partially neutralized lower alkyl vinyl ether-maleic acid or anhydride copolymer, which has been partially neutralized by at least one dentally acceptable monovalent cation and 0–50% of the initial carboxy groups have been crosslinked by at least one dentally acceptable agent selected from the group consisting of divalent cations and polyhydroxy compounds such that up to about 90% of the total number of initial carboxyl groups have been neutralized or crosslinked, wherein a 1% aqueous solution of said neutralized copolymer has a pH of at least about 4.5, or a precursor combination of said copolymer, neutralizing agent and crosslinking agent adapted to form said partially neutralized copolymer in aqueous environment; (c) polyethylene oxide; or (d) a combination of (c) with (a) or (b).

4,373,037

ASBESTOS-FREE FRICTION MATERIAL INCORPORATING ATTAPULGITE CLAY

Frank J. Washabaugh, Titusville, N.J., assignor to Engelhard Corporation, Edison, N.J.

Filed May 29, 1981, Ser. No. 268,510
Int. Cl.³ C08L *61/00*
U.S. Cl. 523—155 **9 Claims**

1. A friction material composition suitable for molded friction pads comprising a thermosetting binder, a non-asbestos fibrous material, particles of heat-treated palygorskite clay, said clay having a volatile matter content below about 5% on a free-moisture-free basis and a carbonate content of not more than about 5% CO_2 by weight on a free-moisture-free basis, and additional conventional fillers and additives, said composition being substantially free from asbestos and said palygorskite clay being present in amount sufficient to provide acceptable wear and high temperature friction properties.

4,373,038

ASBESTOS-FREE FRICTION MATERIAL

Klaus Moraw, Duisburg, and Hans-Günther Paul, both of Duisberg, Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,628
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039089; Oct. 21, 1980, 3039607
Int. Cl.³ C08L *9/06, 61/06, 63/00*
U.S. Cl. 523—156 **9 Claims**

1. An asbestos-free friction material comprising 5 to 25% by weight of a hardenable binder or binder mixture, 1 to 70% by weight of a reinforcing fibrous material and conventional additives, the said reinforcing material consisting essentially of 2.5 to 12% by weight of aramide fibers, 6 to 25% by weight of mineral fibers and 16 to 36% by weight of steel fibers and optionally 5 to 20% by weight of powdered mica.

4,373,039

ELASTOMER COATED FILLERS AND COMPOSITES THEREOF COMPRISING AT LEAST 60% BY WT. OF A HYDRATED FILLER AND AN ELASTOMER CONTAINING AN ACID SUBSTITUENT

William A. Mueller, Glendale; John D. Ingham, La Crescenta, and William W. Reilly, Altadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 11, 1980, Ser. No. 158,530
Int. Cl.³ C08K *5/17*; C08L *29/04, 31/02*
U.S. Cl. 523—205 **9 Claims**

1. A fire retardant composite comprising:
matrix resin containing a dispersion of:
at least 60% by weight of basic, hydrated, particulate, mineral filler capable of evolving water at a temperature above 200° C. having an immobilized and insoluble coating of 1 to 20% by weight based on the filler of an elastomer compatible with the matrix resin having a lower modulus than the matrix resin and the elastomer contains acidic groups ionically cross-linking with the basic filler particles to attach the elastomer coating to the surface of the filler particles.

9. A fire retardant composite comprising:
matrix resin consisting essentially of ethylene-acrylic acid copolymer containing 1 to 10% by weight vinyl acetate and said matrix resin containing a dispersion of:
at least 60% by weight of particulate, mineral, hydrated filler capable of evolving water at a temperature above 200° C. having a coating of 1 to 20% by weight of an elastomer containing an acidic substituent compatible with the matrix resin.

4,373,040

EPOXY MOLDING COMPOUND

Richard B. Allen, Dalton, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Jun. 5, 1981, Ser. No. 270,914
Int. Cl.³ C08L *63/00*
U.S. Cl. 523—466 **7 Claims**

1. A molding compound comprising:
(a) from about 5 to 90% by weight of curable epoxy resin;
(b) from about 0.01 to 10% by weight of an aromatic onium salt of the formula:

$$[R_aX]_b^+[C]^{-b}$$

wherein each R is a monovalent organic aromatic radical; X is selected from the group consisting of sulfur and iodine; C is a lewis acid polymerization catalyst precursor; a equals the absolute value of the valence number of (X minus 1); and b equals the absolute value of the valence number of C;
(c) from about 0.01 to 10% by weight of peroxide compound effective to activate said catalyst; and
(d) from about 10 to 95% by weight of filler, based on the total weight of the composition.

4,373,041

RUBBER COMPOSITIONS CONTAINING SILICA AND TACKIFIER RESINS

Jerold D. Wood, and Carl J. Stacy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1981, Ser. No. 316,163
Int. Cl.³ C08L *93/00, 47/00*
U.S. Cl. 524—77 **22 Claims**

1. A silica-containing vulcanizable composition comprising
(a) a vulcanizable natural or synthetic rubber,
(b) a siliceous filler in an amount ranging from about 5 to about 150 parts by weight per hundred parts by weight of rubber (phr), and
(c) at least one tackifying resin selected from rosin esters, hydrogenated rosin esters, and terpene resins in a minor but effective amount sufficient to increase the bonding of said siliceous filler to said rubber and improve the physical properties of the resulting rubber product, including tensile, hysteresis, and the like.

4,373,042

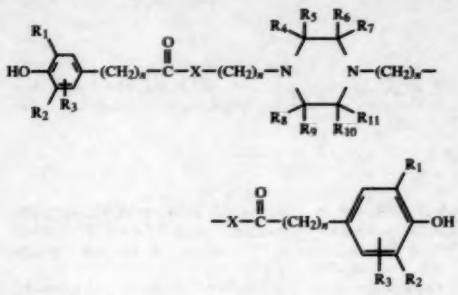
N,N-DI-(HYDROXY-PHENYL) DERIVATIVES OF PIPERAZINE AND USE THEREOF AS STABILIZERS FOR POLYMERS

Francesco Gratani, Sesto San Giovanni; Giuseppe Nelli, Milan; Piero Di Battista, San Donato Milanese, and Osvaldo Cicchetti, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 9, 1980, Ser. No. 148,389
Claims priority, application Italy, May 10, 1979, 22515 A/79
Int. Cl.³ C07D *241/04*; C08K *5/34*
U.S. Cl. 524—100 **12 Claims**

1. A composition comprising a thermo-plastic synthetic

polymer, stabilized to oxidation, to heat and to sunlight, said composition containing incorporated therein, in an amount sufficient to prevent any degradation of the polymer, a N,N'-di-(hydroxy-phenyl) derivative of piperazine having the following formula (I):



in which:

R_1 and R_2, which may be the same or different, are each hydrogen, an alkyl radical having 1 to 8 carbon atoms, an aralkyl radical having 7 to 9 carbon atoms or a cyclo-alkyl radical having 5 to 8 carbon atoms;

R_3 is hydrogen or an alkyl radical having 1 to 8 carbon atoms;

R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11}, which may be the same or different are each hydrogen or an alkyl radical having 1 to 6 carbon atoms, at least two thereof being different from hydrogen, or R_4 and R_5, R_6 and R_7, R_8 and R_9, R_{10} and R_{11} together can form a cycloalkyl radical having 5 to 8 carbon atoms;

n is an integer from 1 to 12; and

X is oxygen.

4,373,043

COLOR DEEPENING AGENT

Kazuhisa Yagi, Wakayama; Sho Suzuki, Funabashi, and Norihiko Nakashima, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,697

Claims priority, application Japan, Feb. 13, 1981, 56/20325

Int. Cl.³ C08K *5/54, 5/53, 5/42, 5/09*

U.S. Cl. 524—130 **23 Claims**

1. A color deepening agent comprising (a) an aqueous resin composition obtained by radical emulsion polymerization of a monomer having a polymerizable unsaturated bond, in the presence of an anionic or a cationic polyurethane emulsion in which the polyurethane contains thermosetting reactive groups capable of forming a cross-linked structure under heating, the refractive index of a dry, heat-treated film of said aqueous resin composition being lower than 1.50, and (b) at least one material selected from the group consisting of polysiloxanes, silane coupling agents, silica, silylating agents, fluorine resins and surface active agents containing a perfluoroalkyl group.

4,373,044

FLAME-PROOFED PLASTICS MOULDING COMPOUNDS

Lothar Buxbaum, Lindenfels, and Franz Breitenfellner, Bensheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,365

Claims priority, application Switzerland, Nov. 28, 1979, 10579/79

Int. Cl.³ C08K *3/22, 3/34, 5/52, 5/53*

U.S. Cl. 524—132 **6 Claims**

1. A thermoplastic polyester moulding compound, which has been flameproofed with one or more organic chlorine- or bromine-containing compounds, which comprises

(a) a thermoplastic polyester, and

(b) from 0.1 to 10%, by weight based on said moulding compound, of one or more aerosols selected from the group consisting of the highly dispersed silicates, highly dispersed alumina, and highly dispersed titanium dioxide incorporated in (a), and wherein the aerosol has an internal surface area of at least 50 m^2/g.

4,373,045

POLYPHENYLENE ETHER MOLDING COMPOSITIONS THAT INCLUDE AN ALKENYL AROMATIC RESIN, AN ETHYLENE PROPYLENE RUBBER AND A TRIARYL PHOSPHATE

Glenn D. Cooper, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 15, 1980, Ser. No. 140,579

Int. Cl.³ C08K *5/52;* **C08L** *71/04*

U.S. Cl. 524—141 **19 Claims**

1. A thermoplastic molding composition which consists essentially of:

(a) a polyphenylene ether resin;

(b) an ethylene propylene rubber; and

(c) a component selected from the group consisting of:

(i) a triaryl phosphate;

(ii) an EPDM modified alkenyl aromatic resin; and

(iii) a combination of (i) and (ii).

4,373,046

FLAME-RETARDANT AND RADIATION-RESISTANT POLYMER COMPOSITION AND A RESIN MOLDED PRODUCT PREPARED THEREFROM

Miyuki Hagiwara, Machashi, and Yousuke Morita, Takasaki, both of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,134

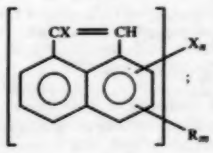
Claims priority, application Japan, Mar. 3, 1980, 55-26383

Int. Cl.³ C08K *5/03;* **C08L** *57/08*

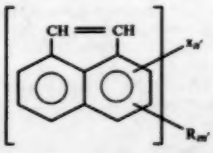
U.S. Cl. 524—285 **19 Claims**

1. A flame-retardant and radiation-resistant polymer composition comprising a polymer and a halogenated acenaphthylene condensate having a structural unit of the formula (I) or (II):

(I)



(II)



wherein X is chlorine or bromine, n and n' are each an integer of 2 to 6, R is a substituent selected from the group consisting of alkyl, alkoxy and alkylester of 1–4 carbons; m and m' are each an integer of 0 to 4, n (or n')+m (or m')≦6, and when m or m' is 2 or more, each R may be the same or different.

4,373,047

FLAME RETARDANT THERMOPLASTIC COMPOSITIONS WITH REDUCED BLOOM

Stuart C. Cohen, and Ronald L. Dieck, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 11,680, Feb. 12, 1979, abandoned. This application Nov. 26, 1980, Ser. No. 210,866

Int. Cl.³ C08L *23/06*

U.S. Cl. 524—371 **12 Claims**

1. In a flame retardant thermoplastic composition consisting essentially of:

(a) a normally flammable high molecular weight polyester;

(b) a flame retardant amount of decabromodiphenylether; and

(c) an effective amount of an organic or in-organic flame retardant synergist compound,

the improvement which consists of including, as component (d), an effective amount of an olefin polymer, an olefin copolymer or a mixture thereof whereby a composition is obtained from which the decabromodiphenyl ether flame retardant shows a reduced tendency to bloom or plate out after molding and thermally aging the molded articles.

4,373,048

HIGH VOLTAGE FLAME RETARDANT EPOM INSULATING COMPOSITIONS

Paul C. Schubert, and Anil C. Thakrar, both of Camp Hill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 142,277, Apr. 21, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 286,806

Int. Cl.³ C08K *5/06, 3/38, 3/22*

U.S. Cl. 524—371 **24 Claims**

1. An ethylene propylene diene terpolymer composition suitable for use as an insulator in high voltage electrical connector applications, said composition comprising an ethylene propylene diene terpolymer, reinforcement fillers, a curing agent and a synergistic mixture of fire retardant agents and flow improvers comprising at least (1) a brominated organic flame retardant, (2) a hydrated alumina flame retardant, (3) an antimony oxide synergist, and (4) a flow improver, which synergistic mixture increases the flow of the composition during molding, increases internal lubrication, and provides better release and non-sticking characteristics,

said composition being characterized by good flame retardancy, tensile strength, elongation and Shore "A" Hardness with good flow during molding.

4,373,049

FLAME-RETARDANT POLYAMIDE COMPOSITIONS

Paul N. Richardson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1981, Ser. No. 318,349

Int. Cl.³ C08K *5/06*

U.S. Cl. 524—375 **6 Claims**

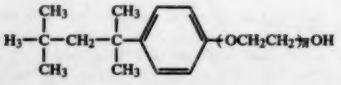
1. A reinforced, flame-retardant composition consisting of

(a) about 37–80 weight percent of composition of a polyamide of film-forming molecular weight selected from nylon 66 or nylon 66/6 copolymer;

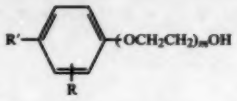
(b) about 22–34 weight percent of composition of a brominated polystyrene having an average molecular weight of at least about 30,000 and containing about 55–70% bromine by weight;

(c) about 5–10 weight percent antimony oxide;

(d) about 1–3 weight percent of composition of a non-ionic surfactant using the formula



wherein n is a cardinal number of from 10–40, or



wherein m is a cardinal number of from 8–15 and R' is alkyl of 9–12 carbon atoms, and R is C_9H_{19}— or H—

the percent amounts of components (a) through (d) totaling 100%.

4,373,050

PROCESS AND COMPOSITION FOR COATING METALS

Lester Steinbrecher, Southampton, and Wilbur S. Hall, Plymouth Meeting, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 904,019, May 8, 1978, abandoned, which is a division of Ser. No. 499,039, Aug. 20, 1974, Pat. No. 4,104,424, which is a continuation-in-part of Ser. No. 113,685, Feb. 8, 1971, abandoned, which is a division of Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, which is a continuation-in-part of Ser. No. 554,336, Jun. 1, 1966, abandoned. This application Jun. 9, 1980, Ser. No. 157,526

The portion of the term of this patent subsequent to Jun. 15, 1988, has been disclaimed.

Int. Cl.³ C08L *9/04, 9/08, 27/06, 75/04*

U.S. Cl. 524—405 **22 Claims**

1. An acidic aqueous coating composition having a pH of about 1.6 to about 3.8 for use in coating a ferriferous surface comprising an acidic aqueous solution of at least about 0.01 oxidizing equivalent/liter of an oxidizing agent which contains oxygen and which has a positive reduction potential greater than that of hydrogen, and about 5 to about 550 g/l of solid particles of a coating-forming polymeric resinous material dispersed throughout the composition, said composition being effective to chemically attack, in the absence of an external electrical potential, a ferriferous surface immersed therein to dissolve therefrom metal in an amount of at least about 25 to about 60 mg/sq. ft. within the first minute of immersion to release ions of said metal and sufficient to cause said resinous material to deposit on said ferriferous surface in the form of an initially adherent coating which increases in weight or thickness the longer the time said surface is immersed in said composition.

4,373,051

POLYVINYL CHLORIDE CONTAINING VINYL ACETATE-ETHYLENE COPOLYMER AS IMPACT STRENGTH MODIFIER

Leroy J. Memering, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Jan. 27, 1981, Ser. No. 228,830

Int. Cl.³ C08K *3/18*

U.S. Cl. 524—427 **10 Claims**

1. A blend of (a) polyvinyl chloride and (b) a vinyl acetate-ethylene copolymer which has been pre-blended with an inert inorganic filler having an average particle size within the range of from about 0.01 microns to about 3 microns, in an amount such that said blend contains from about 1 to about 10 parts by weight of vinyl acetate-ethylene copolymer per 100 parts by weight of polyvinyl chloride and the weight ratio of said vinyl acetate-ethylene copolymer to filler is from about 1:0.5 to about 1:10, said vinyl acetate-ethylene copolymer having a ratio of from about 60:40 to about 25:75 of ethylene to vinyl acetate, whereby said blend has significantly increased impact strength.

4,373,052

POLYPHENYLENE ETHER COMPOSITIONS

Visvaldis Abolins, and Bruce A. Luxon, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 23, 1981, Ser. No. 304,947
Int. Cl.³ C08K 3/34
U.S. Cl. 524—451 13 Claims

1. A thermoplastic resin composition which comprises an intimate admixture of polyphenylene ether resin with an amount of talc filler effective to provide an UL arc tracking rate of less than 1 inch/minute.

4,373,053

COLOR DEEPENING AGENT

Toshio Sato, Wakayama; Sho Suzuki, and Hidemasa Ohmura, both of Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,703
Claims priority, application Japan, Jul. 29, 1980, 55/103904
Int. Cl.³ C08K 5/16
U.S. Cl. 524—457 13 Claims

1. A color deepening agent comprising an aqueous resin composition obtained by radical emulsion polymerization of a monomer having a polymerizable unsaturated bond, in the presence of an anionic or a cationic polyurethane emulsion in which the polyurethane contains thermosetting reactive groups capable of forming a cross-linked structure under heating, the refractive index of a dry, heat-treated film of said aqueous resin composition being lower than 1.50.

4,373,054

DISPERSION PROCESS AND PRODUCT

David V. Gibson, 29 Sutherland Rd., Armadale, Victoria, 3143; Garry M. McKay, 1399 Dandenong Rd., Chadstone, Victoria, 3148, and John E. Swalwell, 9 Amelia Crescent, East Doncaster, Victoria, 3109, all of Australia

Filed Jul. 6, 1981, Ser. No. 280,314
Claims priority, application Australia, Jul. 3, 1980, PE4360; Jun. 16, 1981, PE9302
Int. Cl.³ C08L 61/20
U.S. Cl. 524—460 15 Claims

1. A process of preparing an aqueous dispersion of particles of film-forming polymer suitable for use in a cathodic electrodeposition process, the said process consisting of the following steps in combination:

(1) Pre-formed polymer or polymer plasticiser dissolved in polymerisable α, β-ethylenically unsaturated monomer which has a maximum solubility in water of 10% by weight at 25° C. is stably dispersed in water in the presence of surface active agent; and

(2) unsaturated monomer in the dispersion is polymerised to form a particulate dispersion of film-forming polymer wherein the particles comprise blends of pre-formed polymer or polymer plasticizer and polymer formed in situ from the unsaturated monomer;

characterised in that the stable dispersion in water prior to the initiation of polymerisation has a pH of less than 10 but when subjected to the pH stability test described hereinunder becomes unstable at a pH of 10–11 and the surface active agent is a cationic surface active agent which has a hydrophilic-lipophilic balance (H.L.B. value) of at least 8.

2. A process of preparing an aqueous dispersion according to claim 1, characterised in that when five drops of the dispersion taken prior to the initiation of polymerisation are added to 10 g of de-ionised water, treated with 10^{-2} M potassium hydroxide solution to give a pH of 10–11 and allowed to stand for 10 hr at 25° C., a visible settling of polymer with the formation of a clear upper layer takes place in the sample under test.

4,373,055

IMPACT RESISTANT POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING RADIAL TELEBLOCK COPOLYMERS

William R. Haaf, Voorhesville; Arthur Katchman, Delmar, and Gim F. Lee, Jr., Albany, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 21,951, Mar. 19, 1979, abandoned, which is a continuation of Ser. No. 794,255, May 5, 1977, abandoned, which is a continuation of Ser. No. 671,344, Mar. 29, 1976, abandoned. This application Jul. 25, 1980, Ser. No. 172,265
Int. Cl.³ C08L 53/00
U.S. Cl. 524—505 13 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(i) from about 10 to about 65 percent by weight of a polyphenylene ether resin;

(ii) from about 90 to about 35 percent weight of a styrene resin, and

(iii) from about 5 to about 25 percent by weight of a radial teleblock copolymer comprising a vinyl aromatic compound, a conjugated diene, and a coupling agent.

4,373,056

AQUEOUS ARTIFICIAL RESIN DISPERSIONS FREE OF EMULSIFYING AGENTS

Siegmund Besecke, Darmstadt; Herbert Fink, Bickenbach; Norbert Sutterlin, Ober-Ramstadt; Gerhard Markert, Ober-Ramstadt-Eiche; Gunter Schroder, Ober-Ramstadt, and Willi Tilch, Reinheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,544
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035375
Int. Cl.³ C08L 41/00
U.S. Cl. 524—547 12 Claims

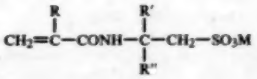
1. An aqueous artificial resin dispersion, comprising:

an aqueous phase free of low molecular weight, ionic emulsifying agents, and

a water-insoluble disperses phase formed from particles containing a copolymer comprising

(a) in substantial part a water-insoluble or slightly soluble first monomer selected from the group consisting of alkyl esters of acrylic or methacrylic acid, vinyl esters, and α-alkenylbenzenes and

(b) from 0.05 to 5% by weight based on said copolymer of a polymerizable emulsifying agent of the formula



wherein R represents hydrogen or methyl,

R′ represents hydrogen or an alkyl radical with 1 to 12 C-atoms,

R″ represents an alkyl radical with 7 to 20 C-atoms, and

M represents a proton, an alkali metal ion, or an ammonium ion.

4,373,057

PROCESS FOR MAKING CURABLE ADHESIVE POLYURETHANE PRODUCTS

James A. Hammond, Redlands, Calif., assignor to Colamco, Inc., Columbus, Ohio

Filed Sep. 14, 1981, Ser. No. 301,838
Int. Cl.³ C07C 79/46; C08G 18/08; C08K 5/09
U.S. Cl. 524—700 20 Claims

1. A polyurethane product, characterized by a natural ab-

sence of polymerization catalyst residue, produced by a one step process consisting essentially of:

(1) the reaction of

(a) isocyanate compound selected from the class consisting of aliphatic, aromatic and cycloaliphatic isocyanates having at least two isocyanate groups; and

(b) diol/polyol compounds having at least two sterically unhindered hydroxyl groups;

(c) said reactants 1*a* and 1*b* being simultaneously present in a stoichiometric excess of said isocyanate groups of about 1–25%;

(2) in the absence of polymerization catalyst;

(3)

(a) said reactants being initially intermingled in the ambient room temperature range of about 65°–86° F.; and

(b) reacted with intermingling in the absence of externally added heat, for the time needed to obtain a product characterized as homogeneous, non-separating viscous liquid ranging to semiliquid, with adhesive properties.

4,373,058

POLYMER CONCRETE COMPRISING FURFURYL ALCOHOL RESIN

Lowell C. Horton, Pensacola Beach, Fla., assignor to Joe G. Hosner, Pensacola, Fla.

Filed Mar. 17, 1981, Ser. No. 244,811

Int. Cl.[3] **C08L** *95/00*; **C08K** *3/36, 3/34*

U.S. Cl. 524—705 **10 Claims**

1. A polymer concrete composition comprising by weight about 40% to about 70% coarse mineral aggregate ranging in size from about 1½ inches to about 0.187 inch, about 20% to 55% fine mineral aggregate ranging from about 0.187 inch to about 0.0059 inch; about 2% to about 15% silica flour; about 8% to about 12% furfuryl alcohol monomer polymerized in situ by the addition of an acid catalyst contained in amounts of about 8% to about 12% by weight of said monomer, said mineral aggregates having a pH less than about 7.0, and the moisture content of the mineral aggregates being less than about 1% by weight.

4,373,059

PRE-CONDENSED, THERMOSETTING AQUEOUS VARNISH COATING AGENT AND ITS UTILIZATION FOR CATHODIC DEPOSITION UPON ELECTRICALLY CONDUCTING SURFACES

Hans-Peter Patzschke, and Armin Göbel, both of Wuppertal, Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit Beschrankter Haftung, Wuppertal, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,040

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936356

Int. Cl.[3] **C08L** *63/02, 77/06, 67/02*

U.S. Cl. 524—761 **17 Claims**

1. A binding agent which is water-dilutable upon protonization with acids, for a pre-condensed, thermosetting aqueous lacquer coating material, said binding agent comprising:

(a) a water-dilutable pre-condensation product having a mean molecular weight (Mn) of about 800 to 15,000 obtainable by heating a first component including a quantity of 55% to 95% by weight, based on the total quantity of the binding agent of an organic synthetic-resin binder containing amino groups and having an amine number of about 30 to 150, and a second component including a quantity of 5% to 45% by weight of a cross-linking agent containing terminal carboxyl groups, the latter being esterified with mono-alcohols in such proportion as will cause the pre-condensate to have an ester number of at least about 30, the ester groups being largely stable in a neutral aqueous medium yet being reactive towards primary and/or secondary amino groups of the synthetic-resin binder in a basic medium at temperatures above about 140° C. to cross link the binding agent by amidation,

(b) said first and second components being heated to temperatures of between 50° and 200° C. for such length of time that, after protonization with acid and dilution with water for the purpose of preparing a lacquer, it shows no precipitation phenomena.

4,373,060

SILICONE COATING FOR UNPRIMED PLASTIC SUBSTRATE AND COATED ARTICLES

Ta-Yen Ching, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 30, 1980, Ser. No. 154,623

Int. Cl.[3] **C08K** *3/20*; **C08L** *83/06*

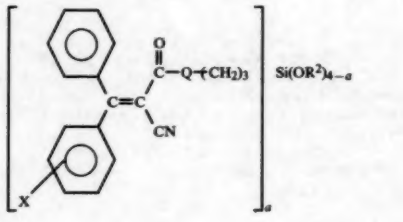
U.S. Cl. 524—767 **12 Claims**

1. A method for making an improved coating composition which comprises making an aqueous cohydrolyzate adapted for adhesion to a plastic substrate without a primer which comprises cohydrolyzing at a temperature of at least 10° C. for a period of at least 2 hours and at a pH of 6.6 to 7.8 or 3.8 to 5.7 prior to addition of an ultraviolet light absorber,

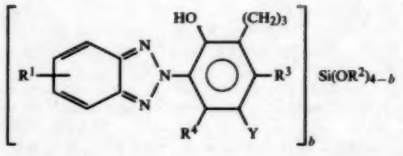
(A) a dispersion of colloidal silica in an aqueous-organic solvent solution of a silanol of the formula $RSi(OH)_3$, at least 50 weight percent of the silanol being $CH_3Si(OH)_3$, wherein said organic solvent comprises an aliphatic alcohol; and

(B) a stabilizing amount effective to prevent discoloration of the substrate and promote primerless adhesion to said substrate of an alkoxysilane functionalized aromatic ultraviolet absorbing compound selected from the class consisting of

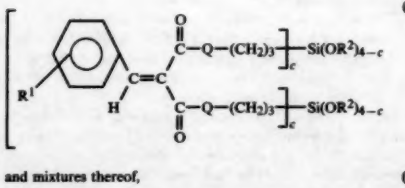
(i)



(ii)

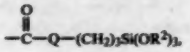


(iii)



and mixtures thereof, (iv)

where (A) contains 10 to 40% solids consisting essentially of 10 to 70 weight percent of colloidal silica and 30 to 90 weight percent of the partial condensate, R is selected from the group consisting of $C_{(1-3)}$ alkyl radicals and $C_{(6-13)}$ aryl radicals, R^1 is selected from the class consisting of hydrogen, C_1–C_8 alkoxy, carboxy, halogen, hydroxy, amino, carbethoxy and $—Q—CH_2)_3Si(OR^2)$, X is R^1 or



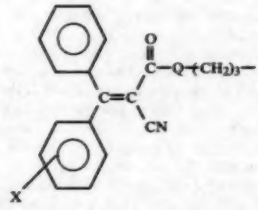
is —NH— or —O—, R^2 is C_1–C_8 alkyl, R^3 is a member selected from the class consisting of hydrogen, halogen, hydroxy, C_1–C_8 alkyl and C_1–C_8 alkoxy, R^4 is a member selected from hydrogen, C_1–C_8 alkyl, C_1–C_8 alkoxy and halogen, Y is R^4 or $—(CH_2)_3Si(OR^2)_3$, and a, b, and c are integers equal to 1 to 3 inclusive.

5. A coating composition adapted for use as a top coat for thermoplastic substrates, without the need to use a primer layer whereby there are produced composites having at least one coated abrasion resistant and UV stabilized surface, said coating composition comprising by weight

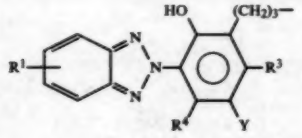
(C) 55 to 90% of a solvent consisting essentially of water and a $C_{(1-8)}$ alkanol and

(D) 10 to 45% of a cohydrolyzate which comprises organopolysiloxane and having from about 25–50 mole percent of SiO_2 units chemically combined with from about 40–75 mole percent of $RSiO_{1.5}$ units and from about 0 to 10 mole percent of $(R)_2(SiO)$ units and from about 0.5 to 5 mole percent of $(Z)_dSiO_{(4-d)/2}$ or $(Z')=SiO_{1.5}$, where the total chemically combined units are 100 mole percent, where d is an integer having a value of 1–3 inclusive and Z is a memer selected from the class consisting of

(i)

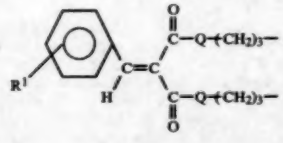


(ii)

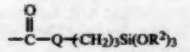


(iii)

Z' is



where R^1 is selected from the class consisting of hydrogen, C_1–C_8 alkoxy, carboxy, halogen, hydroxy, amino, carbethoxy and $—Q—CH_2)_3Si(OR^2)_3$, X is R^1 or



Q is —NH— or —O—, R^2 is C_1–C_8 alkyl, R^3 is a member selected from the class consisting of hydrogen, halogen, hydroxy, C_1–C_8 alkyl and C_1–C_8 alkoxy, R^4 is a member selected from hydrogen, C_1–C_8 alkyl, C_1–C_8 alkoxy and halogen, and Y is R^4 or $—CH_2)_3Si(OR^2)_3$.

4,373,061

SILICONE COATING FOR UNPRIMED PLASTIC SUBSTRATE AND COATED ARTICLES

Ta-Yen Ching, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 30, 1980, Ser. No. 154,624

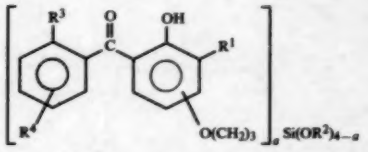
Int. Cl.³ C08K 3/20; C08L 83/06

U.S. Cl. 524—767 **11 Claims**

1. A method for making an improved coating composition which comprises making an aqueous cohydrolyzate adapted for adhesion to a plastic substrate without a primer which comprises cohydrolyzing at a temperature of at least 10° C. for a period of at least 2 hours and at a pH of 6.6 to 7.8 or 3.8 to 5.7 prior to addition of an ultraviolet light absorber,

(A) a dispersion of colloidal silica in an aqueous-organic solvent solution of a silanol of the formula $RSi(OH)_3$, at least 50 weight percent of the silanol being $CH_3Si(OH)_3$, wherein said organic solvent comprises an aliphatic alcohol; and

(B) a stabilizing amount effective to prevent discoloration of the substrate and promote primerless adhesion to said substrate of an alkoxysilane functionalized aromatic ultraviolet absorbing compound of the formula

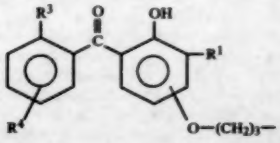


where (A) contains 10 to 40% solids consisting essentially of 10 to 70 weight percent of colloidal silica and 30 to 90 weight percent of the partial condensate, R is selected from the group consisting of $C_{(1-3)}$ alkyl radicals and $C_{(6-13)}$ aryl radical, wherein R^1 is hydrogen, C_1–C_8 alkyl or halogen, R^3 and R^4 are hydrogen, C_1–C_8 alkoxy, carboxy, halogen, hydroxy, amino, carbethoxy, or $—Q—(CH_2)_3Si(OR^2)_3$, Q is —NH— or —O—, R^2 is C_1–C_8 alkyl, and a is an integer equal to 1–3 inclusive.

5. A coating composition adapted for use as a top coat for thermoplastic substrates without the need to use a primer layer whereby there are produced composites having at least one coated abrasion resistant and UV stabilized surface, said coating composition comprising by weight

(C) 55 to 90% of a solvent consisting essentially of water and a $C_{(1-8)}$ alkanol and

(D) 10 to 45% of a cohydrolyzate which comprises organopolysiloxane and having from about 25–50 mole percent of SiO_2 units chemically combined with from about 40–75 mole percent of $RSiO_{1.5}$ units and from about 0 to 10 mole percent of $(R)_2(SiO)$ units and from about 0.5 to 5 mole percent of $(Z)_dSiO_{(4-d)}$, where the total chemically combined units are 100 mole percent, where d is an integer having a value of 1–3 inclusive and Z is of the formula



wherein R^1 is hydrogen, C_1–C_8 alkyl or halogen, R^3 and R^4 are hydrogen, C_1–C_8 alkoxy, carboxy, halogen, hydroxy, amino, carbethoxy or $—Q—(CH_2)_3Si(OR^2)_3$, Q is —NH— or —O— and R^2 is C_1–C_8 alkyl.

4,373,062

PHENOL-RESORCINOL-FORMALDEHYDE RESIN

Gordon E. Brown, 1960 W. 25th, Eugene, Oreg. 97405

Filed Apr. 20, 1981, Ser. No. 255,545

Int. Cl.³ C08L *61/14*

U.S. Cl. 524—841 **9 Claims**

1. The process of preparing an aqueous syrup containing reacted phenol and formaldehyde, and capable of reacting further to provide a hard solid, which process comprises:

reacting an aqueous mixture of phenol and formaldehyde containing a mol ratio of formaldehyde to phenol between 1.7 and 2.8 at a pH of 5.8 to 8.5 for a time-temperature period causing a phenol-formaldehyde polymer to be formed as signified by the appearance of a hydrophobe point upon dilution with water;

adjusting the total formaldehyde to phenol mol ratio to a ratio within the range of 2.1 and 2.8 to 1 if the total ratio is not already within said range and adding alkali metal hydroxide to provide a total mol ratio of alkali metal hydroxide to phenol between 0.10 and 0.38 to 1 and reacting the resulting mixture for a time-temperature period producing a maximum amount of combined formaldehyde to provide an aqueous syrup product which is heat curable to a hard solid.

4,373,063

ELASTOMERIC COMPOSITION

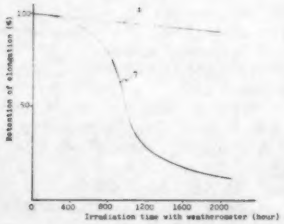
Hajime Sakano, Hirakata; Fumio Nakai, Kurita, and Yukio Tomari, Toyonaka, all of Japan, assignors to Sumitomo Naugatuck Co. Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 256,875

Claims priority, application Japan, Apr. 28, 1980, 55-56452; Jun. 20, 1980, 55-84137

Int. Cl.³ C08L *51/06, 53/00, 75/04, 67/00*

U.S. Cl. 525—64 **16 Claims**



1. An elastomeric composition comprising

(A) a graft polymer of a rubbery copolymer consisting predominantly of ethylene-propylene with at least two groups of the monomers selected from at least one aromatic vinyl compound, at least one ethylenically unsaturated nitrile and at least one methacrylic acid ester, and

(B) a polymer selected from a thermoplastic polyurethane, an aromatic vinyl-conjugated diene block copolymer, a polyester elastomer and an olefinic elastomer, which is a partially crosslinked mixture of an ethylene-propylene rubber and an α-olefinic polymer selected from the group consisting of a polypropylene and an ethylene-propylene block copolymer, said graft polymer (A) and polymer (B) being incorporated in the ratio of 10:90 to 90:10 by weight.

4,373,064

POLYPHENYLENE ETHER COMPOSITIONS

James G. Bennett, Jr., Menands, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 846,544, Oct. 28, 1977, abandoned, which is a continuation of Ser. No. 725,740, Sep. 23, 1976, abandoned, which is a continuation of Ser. No. 283,093, Aug. 23, 1972, abandoned. This application Mar. 23, 1981, Ser. No. 246,383

Int. Cl.³ C08L *71/04, 51/04*

U.S. Cl. 525—68 **7 Claims**

1. A high impact strength thermoplastic composition comprising:

(a) from about 20 to about 80 percent by weight of a polyphenylene ether resin; and

(b) from about 80 to about 20 percent by weight of a rubber modified polystyrene resin, said rubber modified polystyrene comprising a polystyrene matrix in which there is uniformly dispersed a discontinuous phase comprising particles of a styrene homopolymer englobulated in a diene rubber membrane, said particles having an average size ranging from about 0.1 to about 0.7 microns, the membrane thickness being not in excess of about ¼th the average particle diameter, the diene rubber content being from about 1 to about 10% by weight of the rubber modified polystyrene.

4,373,065

OPTICALLY ISOTROPIC DEVICES

William M. Prest, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1981, Ser. No. 235,311

Int. Cl.³ C08L *25/06*; G02B *3/00*

U.S. Cl. 525—132 **5 Claims**

1. An optical recording member for optically recording and retrieving of information thereon, said member having at least one optically isotropic layer made of an optically isotropic polymeric material which is a blend of at least two polymers, said two polymers being completely miscible at least over a range of relative proportions, said two polymers having opposite anisotropies, and the optically isotropic polymeric material having substantially zero birefringence which is not substantially changed by processing of said material into said layer.

4,373,066

POLYMER COMPOSITIONS

Khalid A. Karim; Pallavoor R. Lakshmanan, and James H. Rea, all of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,707

Int. Cl.³ C09J *3/00, 3/14*; C08L *23/08*

U.S. Cl. 525—133 **7 Claims**

1. A compatible blend of polymers consisting essentially of:

(a) A low density ethylene polymer,

(b) An ethylene copolymer,

(c) An ionomer resin, and
(d) A tackifying resin;
said low density ethylene polymer having a density of less than about 0.945 and a normal load melt index of about 0.5–20; said ethylene copolymer having polymerized therein about 70 to 90 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid or vinyl acetate; said two ethylene polymers being present in proportions such that the alkyl ester or vinyl acetate moiety of the ethylene copolymer constitutes about 4–12 weight % of the total weight of the two ethylene polymers; said ionomer resin being a metal salt of an ethylene-acid copolymer which is a copolymer of ethylene and acrylic or methacrylic acid having an acid content of about 1–10 mol % and having a high load melt index of at least about 1.0 and a normal load melt index of up to about 50; said tackifying resin being selected from the group consisting of:
(1) Aromatic hydrocarbon resins having a Ring and Ball softening temperature of about 40°–160° C.,
(ii) Terpene-phenolic resins having a Ring and Ball softening point of about 80°–135° C.
said composition containing 100 parts by weight of the two ethylene polymers and about 15–200 parts by weight of the ionomer resin and tackifying resin.

4,373,067

MOLDED ARTICLES OF IMPROVED IMPACT RESISTANCE AND COMPOSITIONS THEREFOR

Ronald L. Dieck, Sunnyvale, Calif., and Robert J. Kostelnik, Glenalden, Pa., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 4, 1981, Ser. No. 289,966
Int. Cl.³ C08L *67/00, 69/00*
U.S. Cl. 525—146 **20 Claims**

1. A thermoplastic molding composition comprising:
(i) a poly(butylene terephthalate) resin as the principal resinous component therein, and
(ii) a minor amount of at least one rubbery vinyl polymer consisting essentially of a member selected from the group consisting of cis-polybutadiene, poly(butadiene-acrylonitrile), and poly(isoprene-isobutylene) as agent improving the resistance of articles molded from said composition to fracture under impact.

8. A composition according to claim 1 containing a minor but effective amount of an aromatic polycarbonate as supplementary impact resistance-improving agent.

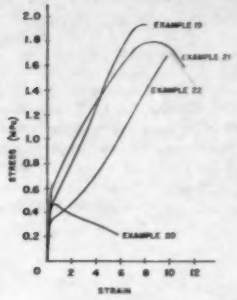
4,373,068

THERMALLY REVERSIBLE COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Binnur Gunesin, Uniontown; Gary R. Hamed, Akron; Jung W. Kang, Clinton, and Donald N. Schulz, Hartville, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 132,737, Mar. 24, 1980, Pat. No. 4,307,210. This application Sep. 18, 1981, Ser. No. 303,219
Int. Cl.³ C08L *33/24*
U.S. Cl. 525—218 **6 Claims**

1. A process for improving the green strength of styrenebutadiene rubber comprising the steps of:
charging a reaction vessel with water, an emulsifier, an initiator and an N-(alkoxymethyl)acrylamide monomer;
purging said vessel with an inert gas;
charging a conjugated diene monomer and an activator to said reaction vessel;
polymerizing said monomers to form a copolymer latex;
coagulating said latex with an aqueous metal salt to form a thermally reversible copolymer; and



compounding said thermally reversible copolymer with said styrene-butadiene rubber.

4,373,069

ELASTOMER COMPOSITIONS

Robert Bond, Staffordshire, and Robert J. Blythe, Birmingham, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 937,194, Aug. 28, 1978, abandoned. This application Aug. 28, 1979, Ser. No. 70,406
Claims priority, application United Kingdom, Sep. 9, 1977, 37823/77
Int. Cl.³ C08L *7/00, 9/00, 9/06*
U.S. Cl. 525—237 **1 Claim**

1. A tire having the combined properties of good grip on a wet road surface and low frictional resistance to rolling on the road, the tread of said tire comprising a material obtained by vulcanizing an elastomer blend comprising:
(a) as a major component a polymer selected from the group consisting of natural rubber, synthetic polyisoprene, rubbery styrene-butadiene copolymer and mixtures thereof having a glass transition temperature at most equal to −50° C.; and
(b) as a minor component at least one resinous styrene-butadiene copolymer having a glass transition temperature above 15° C.; said blend being substantially free of polybutadiene and said minor component being present in an amount up to 45% of the total weight of the major and minor components, which amount is effective to product said combined properties, and wherein said resinous styrene-butadiene copolymer has a styrene content in the range from 80–90% by weight.

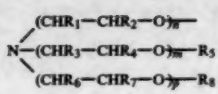
4,373,070

SEQUESTERING AGENTS

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Aug. 25, 1981, Ser. No. 296,212
Claims priority, application France, Aug. 27, 1980, 80 18562
Int. Cl.³ C08L *65/00*
U.S. Cl. 525—332.2 **36 Claims**

1. A composition of matter comprising a cross-linked organic polymeric substrate, said substrate having covalently coupled thereto a plurality of functional groups, the free valence of which having the structural formula:



(I)

wherein R_1, R_2, R_3, R_4, R_6 and R_7, which are identical or different, each represents a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms, R_5 and R_8, which are also identical or different, each represents a hydrogen atom, an alkyl or cycloalkyl radical having 1 to 12 carbon atoms, a phenyl radical, a $-C_qH_{2q}-\phi$ or $C_qH_{2+1}-\phi-$ radical, and further wherein q ranges from 1 to about 12, and n, m and p, which are also identical or different, range from 1 to 10, and ϕ is phenyl.

4,373,071

SOLID-PHASE SYNTHESIS OF POLYNUCLEOTIDES

Keiichi Itakura, Arcadia, Calif., assignor to City of Hope Research Institute, Duarte, Calif.

Filed Apr. 30, 1981, Ser. No. 258,925

Int. Cl.³ C08F 8/40

U.S. Cl. 525—375 **44 Claims**

1. In a method of creating polynucleotides, the following steps:

treating a resin with potassium phthalimide to obtain a phthalimidomethyl-resin,

converting the phthalimidomethyl-resin into an amino resin with hydrazine, and

combining the amino-resin with an activated ester of a nucleoside to obtain an amino-bonded dimethoxytrityl resin.

4,373,072

SELF-CROSS-LINKING, THERMOSETTING, AQUEOUS LACQUER COATING MATERIAL, AND ITS UTILIZATION FOR THE CATHODIC DEPOSITION UPON ELECTRICALLY CONDUCTING SURFACES

Hans-Peter Patzschke, and Armin Göbel, both of Wuppertal, Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschränkter Haftung, Wuppertal, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,041

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936411

Int. Cl.³ C08L 67/04

U.S. Cl. 525—438 **15 Claims**

1. A self-cross linking binding agent rendered water-dilutable by protonization with acids for a self-cross-linking, thermosetting aqueous lacquer coating medium, comprising

(a) a synthetic resin with a mean molecular weight (M_n) of about 500 to 15,000 containing amino groups as well as carboxyl groups some of which are esterified with monoalcohols containing from 1 to 6 carbon atoms,

(b) said resin having an amine number of about 20 to 180 and an ester number of between 20 and 350,

(c) the ester group being substantially stable in a neutral aqueous medium,

(d) said ester groups being reactive with the primary and/or secondary amino groups of the synthetic resin in a basic medium at temperatures above about 140° C.

4,373,073

PROCESS FOR THE PREPARATION OF GLYCIDYL ETHERS OF MONOHYDRIC OR POLYHYDRIC PHENOLS, THE GLYCIDYL ETHERS AND USE THEREOF

Bernhard Wojtech, Bad Soden am Taunus; Hans-Joachim Kiessling; Wilhelm Becker, both of Hamburg, and Kurt Hermann, Idstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,586

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947469

Int. Cl.³ C08G 59/06, 59/08

U.S. Cl. 525—507 **10 Claims**

1. A process for the preparation of glycidyl ethers of phenols which comprises the steps of reacting (A) a monohydric or polyhydric phenol with an epihalohydrin in the presence of a conventional condensation catalyst to form a halohydrin ether and (B) adding thereto aqueous alkali and one of the components.

(a) a catalyst derived from at least one onium compound the substituents of which consists of hydrocarbon radicals selected from the group consisting of

(1) quarternary ammonium compounds with at least one aliphatic C_4–C_{22} hydrocarbon radical, and,

(2) tertiary sulphonium compounds; and

(b) compounds which will form in the reaction mixture in situ before the addition of the alkali, such an onium compound which is derived from the hylohydrin ethers and a corresponding substance selected from the group consisting of tertiary amines, teritary phosphines and thioethers and subjecting this mixture in the presence of an inert solvent or excess unreacted epihalohydrin to dehydrohalogenation of said halohydrin ether, the onium compound having a monovalent anion.

4,373,074

ACETYLENE-CONJUGATED DIENE POLYMERIZATION

Junji Furukawa, Kyoto; Nobuo Furuno, Neyagawa; Akira Matsumura, Neyagawa, and Teruaki Kuwajima, Neyagawa, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Jun. 3, 1981, Ser. No. 270,121

Claims priority, application Japan, Jun. 3, 1980, 55-75227; Jun. 3, 1980, 55-75228; Jun. 3, 1980, 55-75229; Jun. 3, 1980, 55-75230

Int. Cl.³ C08F 4/70

U.S. Cl. 526—92 **7 Claims**

1. A process for preparing copolymers of acetylene and conjugated diene compounds by copolymerization of acetylene with at least one conjugated diene compound in the presence of a catalyst composition in a reactor, wherein the catalyst composition comprises a dialkyl aluminum halide, an organic nickel compound and an active hydrogen compound selected from the group consisting of water, organic acids and alcohols, of which the molar concentrations have the following relationships:

$[Al]=2[Ni]+[H]$

$[Al]/[Ni]>4$

wherein [Al], [Ni] and [H] represent respectively the molar concentrations of the dialkyl aluminum halide, of the organic nickel compound and of the active hydrogen compound.

4,373,075

FROZEN EMULSION INITIATION OF POLYOL (ALLYL CARBONATE)

Richard A. Schwarz, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1981, Ser. No. 330,424
Int. Cl.³ C08L 45/00
U.S. Cl. 526—230.5 24 Claims

1. In a method of polymerizing a water insoluble polyol (allyl carbonate) by contacting the polyol(allyl carbonate) with a water insoluble initiator, the improvement comprising:
(1) forming a composition comprising:
a. the water insoluble polyol (allyl carbonate), and
b. an emulsion of the water insoluble initiator, an emulsifier, and water;
(2) adding a coagulant to the composition whereby to form an aqueous phase coagulum comprising coagulant and water, and an organic liquid phase comprising polyol (allyl carbonate) and initiator;
(3) separating the coagulum from the organic liquid phase; and
(4) thereafter forming a polymerizate of polyol(allyl carbonate).

4,373,076

TERPOLYMER WITH A HIGH REFRACTIVE INDEX

Niro Tarumi, Akishima; Mitsuo Sugimura, Fussa; Shigeo Komiya, Akishima, and Makoto Tsuchiya, Tokyo, all of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,127
Int. Cl.³ C08F 26/06
U.S. Cl. 526—261 1 Claim

1. A high refractive lens formed of a terpolymer produced by polymerizing a mixture comprising by weight 40 to 80% of diethylene glycol bisallyl carbonate, 10 to 30% of triallylisocyanurate and 10 to 30% of benzyl methacrylate.

4,373,077

ANAEROBICALLY CURING COMPOSITIONS

Charles W. Boeder, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 203,684, Nov. 3, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,781
Int. Cl.³ C08F 20/10
U.S. Cl. 526—309 14 Claims

1. An anaerobically-curing composition free of peroxy intiators and inorganic salt initiators, said composition comprising:
(A) 100 parts by weight of a polymerizable monomer having at least one α,β-unsaturated carboxyl functionality per molecule of monomer;
(B) as a first initiator component, about 0.1 to 20 parts by weight of a compound selected from the group consisting of organic sulfimides and perfluoroalkyl sulfonanilides;
(C) as a second initiator component, about 0.05 to 20 parts by weight of a secondary or tertiary aromatic amine; and
(D) as a polymerization inhibitor, about 0.01 to 3 parts by weight of a diaryl N-nitrosamine.

4,373,078

PROCESS FOR THE MANUFACTURE OF HARDENABLE COPOLYMERS AND THE USE THEREOF

Jürgen Ritz, Mainz; Hannes Fischer, Taunusstein, and Helmut Plum, Übach-Palenberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,383
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031655
Int. Cl.³ C08F 20/26
U.S. Cl. 526—317 10 Claims

1. A process for the manufacture of hardenable copolymers which comprises reacting at least one olefinically unsaturated dicarboxylic acid or an anhydride thereof with a polyhydric alcohol and a monoepoxide compound in at least one step, to yield an olefinically unsaturated diester containing OH groups and copolymerising this diester with a combination of (a) at least one copolymerisable monomer which contains no free COOH groups and (b) at least one copolymerisable monomer containing free COOH groups.

4,373,079

LAYERED OR AMORPHOUS CYCLIC ORGANOMETALLIC INORGANIC POLYMERS

Victor E. Parziale, Irvine; Martin B. Dines, Santa Ana, and Peter M. DiGiacomo, Mission Viejo, all of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 945,971, Sep. 26, 1978, Pat. No. 4,232,146, and Ser. No. 60,077, Jul. 24, 1979. This application Sep. 25, 1979, Ser. No. 78,636
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.³ C08G 67/00, 79/04, 79/00
U.S. Cl. 528—9 25 Claims

1. A solid inorganic polymeric compound having basic structural units of the formula:

$$M(O_3ZO_xR)_n$$

in which M is one or more tetravalent metals, Z is a pentavalent atom selected from the group consisting of phosphorus, arsenic, antimony, vanadium, niobium, tantalum and mixture thereof, R is an organo group selected from alicyclic, heterocyclic or aromatic groups, x is 0 or 1, and n is 2, provided that n is 1 when R is terminated with a tri- or tetra-oxy pentavalent atom.

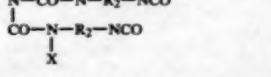
4,373,080

POLYISOCYANATES, PREPARATION AND USE THEREOF

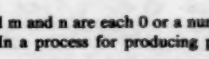
Wolfgang Reichmann, Duesseldorf; Klaus König, and Manfred Schönfelder, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,356
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1978, 2856864
Int. Cl.³ C08G 18/78; C07C 127/24
U.S. Cl. 528—45 4 Claims

1. A polyisocyanate corresponding to the formula:



wherein
R_1 represents an aliphatic hydrocarbon radical selected from the group consisting of methyl, ethyl and propyl;
R_2 represents hexamethylene;
R_3 represents propylene;
X represents a radcial corresponding to the formula:



and m and n are each 0 or a number from 0 to 2.

4. In a process for producing polyurethane by reacting a

polyisocyanate with active hydrogen containing materials, the improvement wherein said polyisocyanate is the polyisocyanate of claim 1, optionally blocked with blocking agents.

4,373,081

COATING COMPOSITIONS AND PROCESS FOR THE PRODUCTION OF POLYURETHANE COATINGS

Klaus Nachtkamp, Cologne; Manfred Bock; Gerhard Mennicken, both of Leverkusen, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,242

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046409

Int. Cl.³ C08G *18/80*; B22B *27/40*

U.S. Cl. 528—45 **5 Claims**

1. A thermally cross-linkable coating composition which is liquid and stable in storage at room temperature and which contains combinations of dialkyl-malonate-blocked polyisocyanates and organic polyhydroxyl compounds as binder and, optionally, auxiliaries and additives, characterized in that said binder comprises

(a) a polyisocyanate component containing dialkyl-malonate-blocked isocyanate groups and a content of blocked isocyanate groups, expressed as NCO, based on the weight of the polyisocyanate component excluding the weight of the blocking agent, of from about 3 to 33.6% by weight comprising

(aa) at least one dialkyl-malonate-blocked, optionally alkyl-substituted diisocyanato-diphenyl methane and/or

(ab) at least one dialkyl-malonate-blocked NCO-prepolymer based on excess quantities of optionally alkyl-substituted diisocyanato-diphenyl methane and organic compounds containing at least two hydroxyl groups and

(b) a polyol component having an average hydroxyl functionality of greater than 2 and a content of alcoholic hydroxyl groups of from about 1.5 to 8% by weight, comprising at least one polyester polyol, in quantities corresponding to an equivalent ratio of blocked isocyanate groups to hydroxyl groups of from about 0.6:1 to 2:1.

4,373,082

CURATIVE FOR A TWO COMPONENT ISOCYANATE ADHESIVE AND SAID ADHESIVE

Michael E. Kimball, Ashland, and Marvin T. Randleman, New London, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 16, 1981, Ser. No. 321,660

Int. Cl.³ C08G *18/32*

U.S. Cl. 528—60 **7 Claims**

1. A curative component for a two component isocyanate adhesive composed of a mixture of 1 to 10 equivalents of at least one polyol of 400 to about 6000 molecular weight and 1×10^{-3} to 1 equivalents of polyamine, said mixture having been reacted with at least 1×10^{-2} to no more than 2 equivalents of an organic polyisocyanate at a temperature of 32° to 82° C. to form insoluble micelles, said micelles being capable of disappearing not to reappear upon heating above 90° C.

7. A polyurethane adhesive composed of 1 to 4 parts of a prepolymer component and 1 part of a curative formed by a mixture of 1 to 10 equivalents of at least one polyol of about 400 to about 6000 molecular weight and 1×10^{-3} to 1 equivalent of diamine with at least part of said polyol and diamine being reacted with an organic diisocyanate to form micelles which exhibited very strong urea peaks and weak urethane peaks upon examination with NMR.

4,373,083

PROCESS OF MAKING URETHANE RHEOLOGY MODIFIERS

Jerome A. Seiner, Pittsburgh, and Karl F. Schimmel, Verona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 220,886

Int. Cl.³ C08G *18/12, 18/48*

U.S. Cl. 528—67 **15 Claims**

1. A process for making a urethane rheology modifier characterized in having a branched structure and hydrophobic tails, comprising the steps of:

(1) reacting in an organic solvent

(a) for each 8 moles of a polyalkylene oxide having a molecular weight of from about 2,000 to about 20,000;

(b) about 0.1 moles to about 3 moles of a polyfunctional material, wherein said material has at least 3 active hydrogens capable of reacting with isocyanate or is a polyisocyanate having at least 3 isocyanate groups;

(c) about 4 moles to about 15 moles of a diisocyanate;

(d) less than about 3 moles water; and

(e) an amount of additional diisocyanate to compensate for any water present,

wherein the organic solvent is selected from the group consisting of 1-methyl-2-pyrrolidinone, dimethyl formamide, dimethyl acetamide, gamma butyrolactone, dioxane, dimethyl and diethyl ethers of ethylene glycol and diethylene glycol, acetonitrile, and mixtures thereof; and

(2) end-capping the reaction product of step (1) with a monofunctional active hydrogen-containing compound or monoisocyanate so as to cap substantially all free isocyanate or hydroxyl groups.

4,373,084

SULFUR-MODIFIED POLYPROPYLENE ETHER GLYCOLS, A METHOD FOR PREPARING THEM, AND POLYURETHANES PREPARED THEREFROM

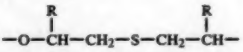
Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 7, 1981, Ser. No. 281,199

Int. Cl.³ C08G *18/52*; C09K *3/00*

U.S. Cl. 528—79 **10 Claims**

1. Polypropylene ether glycol modified so that it contains in its chain 1–25%, by weight, of moieties represented by the structure



where R is hydrogen, an alkyl radical of 1–3 carbon atoms or phenyl, and the oxygen atom is linked to a hydrogen atom or a carbon atom.

9. A polyurethane which is the reaction product of

(a) the polypropylene ether glycol of claim 1, 2, 3 or 4;

(b) an organic polyisocyanate; and

(c) a chain extender.

4,373,085

POLYESTERAMIDE ADHESIVES

Manfred Bolze, Bergkamen-Oberaden, and Manfred Drawert, Froendenberg, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,660

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033132

Int. Cl.³ C08G *69/44*

U.S. Cl. 528—291 **6 Claims**

1. A polyesteramide prepared by the condensation of

(A) a dimerized fatty acid having 16–44 carbon atoms,

(B) a sole diamine of the formula

$H_2N—R—NH_2$

wherein R is aliphatic hydrocarbon having 2–36 carbon atoms, and

(C) diglycolamine of formula $H_2N\text{-}CH_2CH_2\text{-}O\text{-}CH_2\text{-}CH_2\text{-}OH$.

4,373,086

CURABLE RESIN COMPOSITION FROM CYANATE ESTER AND ACRYLIC ESTER

Nobuyuki Ikeguchi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,428
Claims priority, application Japan, Feb. 6, 1980, 55/13202
Int. Cl.³ C08G 73/12, 83/00
U.S. Cl. 528—322 10 Claims

1. A curable resin composition comprising:

(a) at least one cyanate ester compound selected from the group consisting of:

(1) a polyfunctional aromatic cyanate ester monomer having the formula:

$$R\text{-}(O—C\equiv N)_m$$

wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a homoprepolymer of one or more cyanate esters of (1), and

(3) a coprepolymer of (1) and an amine; and

(b) at least one compound having two or more acrylic ester groups selected from the group consisting of:

(i) compounds represented by the formula

$$R^{11}\text{-}(O—\underset{\underset{O}{\|}}{C}—\underset{\underset{X}{|}}{C}=CH_2)_n$$

wherein R^{11} is aliphatic hydrocarbon having 1–15 carbon atoms, or hydroxy or halogen-substituted hydrocarbon having 1–15 carbon atoms, X is hydrogen or methyl, and n is an integer and is 2, 3, 4, 5 or 6, and the valency of R^{11} is the same as n;

(ii) compounds represented by the formula

$$R^{12}\text{-}(\text{-}(OR^{13})_p—O—\underset{\underset{O}{\|}}{\overset{\overset{X}{|}}{C}}—\underset{\underset{X}{|}}{C}=CH_2)_k$$

wherein R^{12} is aliphatic hydrocarbon or hydroxy or halogen-substituted hydrocarbon, R^{13} is alkylene or hydroxy or halogen-substituted alkylene, R^{12}, R^{13}, p and k are selected so that (the number of carbon atoms of R^{12})+(the number of carbon atoms of R^{13})×(p)×(k) is 15 or less, X is as defined above and the valency of R^{12} is the same as k, and k is 2, 3, 4, 5 or 6;

(iii) compounds represented by the formula

$$CH_2=\underset{\underset{X}{|}}{C}—\overset{\overset{O}{\|}}{C}—O\text{-}(R^{14}O)_q—\underset{\underset{O}{\|}}{C}—\underset{\underset{X}{|}}{C}=CH_2$$

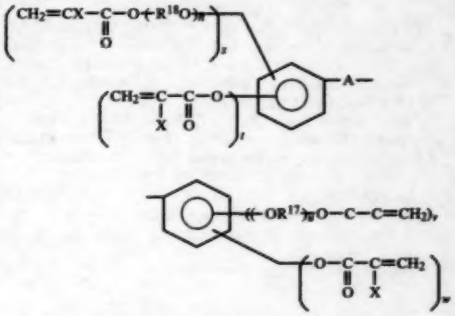
wherein R^{14} is alkylene, or hydroxy or halogen-substituted alkylene, R^{14} and q are selected so that (the number of carbon atoms of R^{14})×(q) is 15 or less, X is as defined above;

(iv) compounds represented by the formula

$$\left(CH_2=\underset{\underset{X}{|}}{C}—\overset{\overset{O}{\|}}{C}—O\right)_l—(R^{15})—\left((R^{16}O)_q—\underset{\underset{O}{\|}}{C}—\underset{\underset{X}{|}}{C}=CH_2\right)_m$$

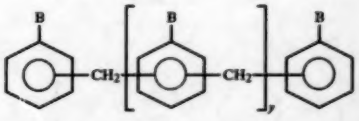
wherein R^{15} is aliphatic hydrocarbon or hydroxy or halogen-substituted hydrocarbon, R^{16} is alkylene or hydroxy or halogen-substituted alkylene, l+m is 2, 3, 4, 5 or 6, (the number of carbon atoms of R^{15})+(the number of carbon atoms of R^{16})×(s)×(m) is 15 or less, X is as defined above, and the valency of R^{15} is the same as l+m;

(v) compounds represented by the formula

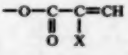


wherein R^{17} and R^{18} are the same or different, and independently alkylene having 2–3 carbon atoms, or hydroxy or halogen-substituted alkylene having 2–3 carbon atoms, A is —O—, $—CH_2—$, $—C_2H_4—$, or $—C_3H_6—$, t and w are independently 0 or 1, v and z are independently 1 or 2, and u and h are independently 0 or integer 1–7, and X is as defined above,

(vi) compounds represented by the formula

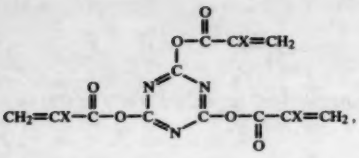


wherein y is 1, 2, or 3 and at least two of B groups on the benzene rings are



wherein X is as defined above and the remainder of B groups are hydroxy;

(vii) compounds represented by the formula



wherein X is as defined above, and mixtures thereof; said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

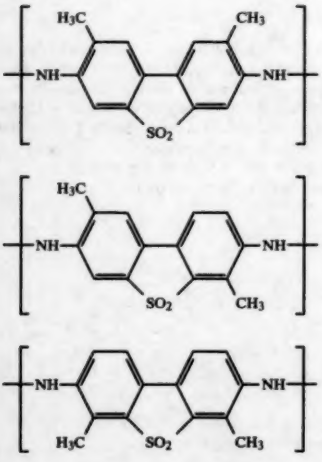
4,373,087

O-TOLIDINE SULFONE BASED COPOLYAMIDE FIBER

Takaho Kaneda, Chiba; Seiji Ishikawa, Ichihara; Hiroshi Daimon, Ichihara; Toshio Katsura, Ichihara; Tadahiro Hondo, Ichihara, and Masahiro Ueda, Ichihara, all of Japan, assignors to UBE Industries Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 973,636, Dec. 27, 1978, abandoned. This application Mar. 13, 1981, Ser. No. 243,423
Claims priority, application Japan, Jan. 6, 1978, 53-282
Int. Cl.³ C08G 69/32
U.S. Cl. 528—337 5 Claims

1. A fiber composed of a high-molecular-weight copolyamide consisting essentially of units (A) represented by the following formulae:



units (B) represented by the following formula:

and units (C) represented by the following formula:

in which units (A), (B) and (C) are present in such amounts that the sum of amounts of units (A) and (B) is substantially equimolar to the amount of the units (C) and the molar ratio of the units (A) to the units (B) is in the range of from 10/90 to 50/50.

4,373,088

TRANSPARENT POLYAMIDES FROM BRANCHED CHAIN DIAMINE AND CYCLOALIPHATIC DIAMINE

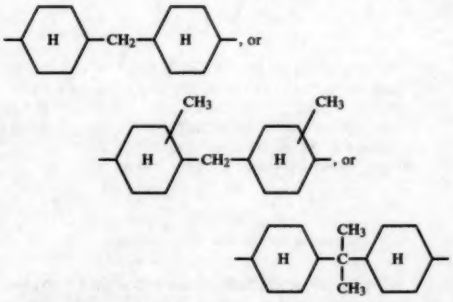
Josef Disteldorf, Am Sengenhoff 2a; Werner Hübel, Am Birnenbruch 34, both of 4690 Herne 1; Siegfried Brandt, Grabenstrasse 8, and Hans-Jürgen Haage, Gauss-strasse 13, both of 4690 Herne 2, all of Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 147,960
Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921495
Int. Cl.³ C08G 69/26
U.S. Cl. 528—338 6 Claims

1. A solid transparent polyamide consisting of repeating structural units of the formula

—HN—R—NH—OC—R'—CO—,

in which R' is the hydrocarbon radical of terephthalic acid and R is 60–95 mole percent of a divalent hydrocarbon radical of the compounds (a), 5-methylnonamethylene, (b) 2,4-dimethyloctamethylene, and (c) 2,4,6-trimethylheptamethylene, wherein the mole ratio a:b:c is between 1:0:0 and 0.50:0.45:0.05, and 40–5 mole percent of a divalent hydrocarbon radical of the formula



wherein the polyamide has a glass transition temperature of 125° to 180° C.

4,373,089

PHENANTHRENE BASED POLYIMIDE RESIN

Joseph G. Robinson, Winchcombe, and David I. Barnes, Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 3, 1981, Ser. No. 240,007
Claims priority, application United Kingdom, Mar. 19, 1980, 8009255
Int. Cl.³ C08G 73/10
U.S. Cl. 528—353 8 Claims

1. A method of producing a polyimide resin comprising reacting a phenanthrene anhydride prepared by (1) converting a phenanthrene to its 9, 10 diol derivative; (2) reacting said derivative with formaldehyde or a formaldehyde donor in the

presence of an acid catalyst to give a reaction product having substantially only methylene bridges between adjacent phenanthrene moieties; (3) oxidizing said reaction product to break the 9, 10 bond in the phenanthrene moieties to give a polycarboxylated product and (4) dehydrating said polycarboxylated product to produce its anhydride derivative; with an aromatic diamine to form the polyimide resin.

4,373,090

ARYLENE SULFIDE POLYMER PREPARATION

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1982, Ser. No. 349,275
Int. Cl.³ C08G 75/14
U.S. Cl. 528—387 4 Claims

1. A method for producing polymers comprising:

(a) contacting at polymerization conditions an anhydrous reaction mixture comprising:

(1) at least one polyhalo-substituted aromatic compound,

(2) at least one organic amide,

(3) at least one alkali metal hydroxide, and

(4) H_2S, and

(b) maintaining said reaction mixture at polymerization conditions for a time sufficient to produce polymer.

4,373,091

ARYLENE SULFIDE POLYMER PURIFICATION

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 7, 1980, Ser. No. 205,052
Int. Cl.³ C08F 6/24
U.S. Cl. 528—481 16 Claims

1. A process for the reduction of ash-forming impurities contained in arylene sulfide polymers and/or stabilize the melt flow of at least partially cured arylene sulfide polymers which polymers have been purified to substantially remove contaminants such as metal halides, organic solvents, metal sulfides, and other impurities present in the crude reaction product which comprises contacting an aqueous slurry consisting essentially of particulate purified arylene sulfide polymer containing ash-forming impurities and/or at least partially cured purified arylene sulfide polymer and water with an oxygen-containing gas and at least one water soluble chemical treating agent selected from sodium hydroxide and sodium carbonate at an elevated temperature not exceeding about 25° F. below the melting point of the polymer for a period of time sufficient to reduce the ash content and stabilize the melt flow of the polymer.

6. A process for the reduction of ash-forming impurities contained in arylene sulfide polymers and/or stabilize the melt flow of at least partially cured arylene sulfide polymers which polymers have been purified to substantially remove contaminants such as metal halides, organic solvents, metal sulfides, and other impurities present in the crude reaction product which comprises contacting an aqueous slurry consisting essentially of particulate purified arylene sulfide polymer containing ash-forming impurities and water in the absence of added oxygen-containing gas with at least one water soluble chemical treating agent selected from

(a) alkaline earth metal carboxylates

(b) organic acids and

(c) inorganic basic compounds selected from hydroxides and carbonates of the alkali and alkaline earth metals, at an elevated temperature not exceeding about 25° F. below the melting point of the polymer for a period of time sufficient to reduce the ash content and stabilize the melt flow of the polymer.

4,373,092

METHOD OF PROCESS CONTROL FOR THERMOSETTING RESINS HAVING ADDITION-TYPE REACTIONS

Andrew Zsolnay, Manhattan Beach, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 29, 1980, Ser. No. 220,370
Int. Cl.³ C08F 6/00
U.S. Cl. 528—481 7 Claims

1. The method of curing a thermosetting polymeric material which undergoes an addition-type reaction during curing, comprising the steps of:

(a) determining from a first sample of said material the optimum time for applying pressure to said material;

(b) determining that frequency of an alternating current signal applied to a second sample of said material which causes a characteristic value of dissipation to occur at said optimum time;

(c) applying heat to a third sample of said material to initiate curing thereof;

(d) applying an alternating current signal having said determined frequency to said third sample to generate a dissipation curve, as said curing progresses, having said characteristic value at said optimum time;

(e) generating a pressure application control signal when said characteristic value is reached; and

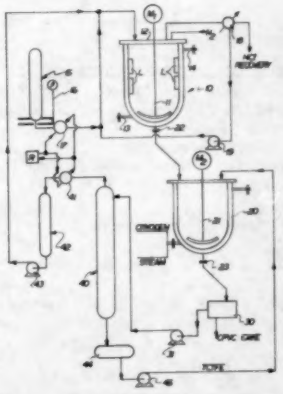
(f) applying pressure to said third sample of said material in response to said control signal.

4,373,093

RECOVERY OF CHLORINATED POLY(VINYL CHLORIDE)

Alan J. Olson, Westlake, and Robert G. Vielhaber, Doylestown, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 24, 1980, Ser. No. 219,650
Int. Cl.³ C08F 6/00
U.S. Cl. 528—491 10 Claims



1. A process for recovering chlorinated poly(vinyl chloride) from a syrup of said chlorinated poly(vinyl chloride) dissolved in liquid chlorine, said process comprising,

(a) adding said syrup to a halogenated lower alkane in which said liquid chlorine is substantially completely soluble,

(b) precipitating said chlorinated poly(vinyl chloride) as discrete solid particles, and,

(c) recovering said solid particles.

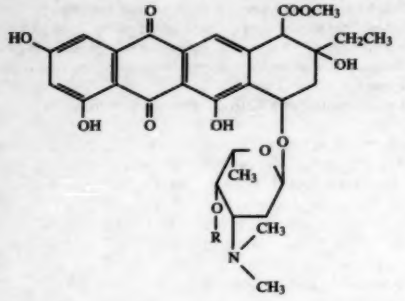
4,373,094

ANTHRACYCLINE DERIVATIVES

Toshikazu Oki, Yokohama; Yasue Matsuzawa, Fujisawa; Tomoyuki Ishikura, Chigasaki; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

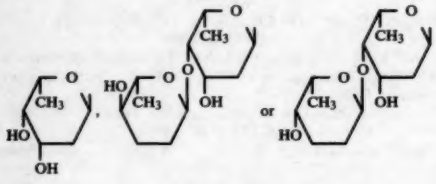
Filed Jul. 29, 1981, Ser. No. 288,072
Claims priority, application Japan, Aug. 1, 1980, 55-106522
Int. Cl.³ A61K 31/71; C07H 15/24
U.S. Cl. 536—6.4 5 Claims

1. Anthracycline derivatives and acid addition salts thereof having the general formula:



(I)

wherein R represents a hydrogen atom, or a sugar chain moiety of the formula:



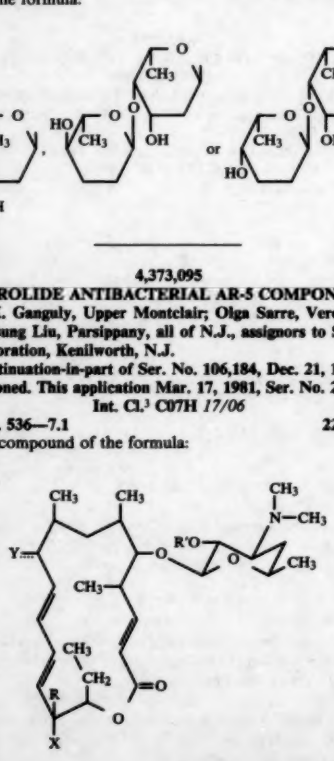
4,373,095

MACROLIDE ANTIBACTERIAL AR-5 COMPONENTS

Ashit K. Ganguly, Upper Montclair; Olga Sarre, Verona, and Yi-Tsung Liu, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 106,184, Dec. 21, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,541
Int. Cl.³ C07H 17/06
U.S. Cl. 536—7.1 22 Claims

1. A compound of the formula:



wherein R is a member of the group consisting of hydrogen and hydroxyl; R′ is a member of the group consisting of hydrogen, and C_2–C_{18} hydrocarbon carbonyl; Y is a member of the group consisting of oxo, and hydroxyl and solid and the dotted lines combined represent optionally a single or a double bond, and X is a monovalent organic radical bonded by a carbon atom to the macrolide ring, said X being a member selected from the group consisting of —CH_2OR', —CH_2OH, —CHO, —CH_2NH_2, —CH_2NHR'', —$CH_2NR''R'''$, CH_2OCOR'', —CH_2NHCOR'' and —CH_2O-glycosyl, excluding mycinosyl and 3″-desmethylmycinosyl wherein R″ and R‴ independently are members of the group consisting of C_1–C_8 alkyl, C_7–C_{18} aralkyl and C_3–C_7 heterocycle wherein the hetero atom is sulfur, nitrogen or oxygen.

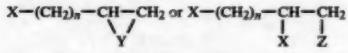
4,373,096

CROSSLINKED CHITIN DERIVATIVES

Junichi Koshugi, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 132,787
Claims priority, application Japan, Apr. 6, 1979, 54/41812
Int. Cl.³ C08B 37/08
U.S. Cl. 536—20 3 Claims

1. A crosslinked derivative of chitin prepared by the process comprising (a) crosslinking natural chitin or regenerated chitin with a crosslinking agent selected from the group consisting of compounds represented by the formula,



wherein X is an atom of chlorine of bromine; Y is an atom of oxygen or sulfur; Z is a hydroxyl- or thiol group and n is an integer of 1, 2 or 3, (b) carboxylating the thus crosslinked chitin or crosslinked regenerated chitin with an etherifying agent selected from halogenocarboxylic acids represented by the formula, X—$(CH_2)_n$—COOH, wherein X is an atom of chlorine or bromine and n is an integer of 1, 2 or 3 and (c) de-acetylating the thus carboxylated crosslinked chitin with an aqueous 4 to 15 N alkali solution at a temperature of 65° to 150° C. for 0.1 to 48 hours to obtain said crosslinked derivative of chitin of a degree of crosslinking of 0.01 to 0.3, a degree of carboxyalkylation of 0.1 to 0.9 and a degree of de-acetylation of 0.1 to 1.0 per N-acetylglucosamine unit.

4,373,097

PROCESS FOR PREPARING ADENOSINE DERIVATIVES OF ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY

Giorgio Stramentinoli, and Federico Gennari, both of Milan, Italy, assignors to BIORESEARCH S.r.l., Milan, Italy

Filed Apr. 27, 1981, Ser. No. 257,969
Int. Cl.³ C07H 19/16
U.S. Cl. 536—26 3 Claims

1. A process for preparing 5′-deoxy-5′-methylthioadenosine, wherein S-adenosyl-methionine, in concentrated aqueous solution, is hydrolysed by heating under reflux, and the 5′-deoxy-5′-methylthioadenosine formed is separated by cooling after neutralising the reaction mixture.

4,373,098

PROCESS FOR CONVERTING CELLULOSE DIRECTLY INTO ALKALI CELLULOSE

Gedeon I. Deak, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1981, Ser. No. 294,790
Int. Cl.³ C08B 1/08
U.S. Cl. 536—101 4 Claims

1. A process for converting cellulose into alkali cellulose which comprises combining:

(a) particles of cellulose with the largest 1% of the particles

having a minimum size Y of less than 600 microns and the bulk density X of the particles being greater than 0.2 g/cm^3 such that the relationship between X and Y is defined by the equation $Y\text{-}760X \leq 50$; and

(b) 125 g to 240 g of 20–40% aqueous NaOH for each 100 g of cellulose for at least 4 minutes at 15°–60° C.

4,373,099

CONTINUOUS PROCESS FOR PREPARATION OF A THINNED CATIONIC STARCH PASTE

E. Daniel Hubbard, West Liberty, and Richard D. Harvey, Muscatine, both of Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Oct. 7, 1981, Ser. No. 309,268
Int. Cl.^{3} C08B *31/00, 31/18*
U.S. Cl. 536—105 24 Claims

1. A process for preparing thinned starch pastes which comprises substantially simultaneously reacting starch and caustic with a water soluble oxidant and a cationic monomeric halogenated alkyl or alkenyl amine.

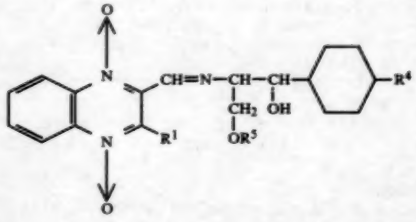
4,373,100

METHYL-QUINOXALINE-1,4-DIOXIDE DERIVATIVES

Pal Benkö; Daniel Bozsing; Janos Gundel, and Karoly Magyar, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Jun. 2, 1981, Ser. No. 269,720
Claims priority, application Hungary, Jun. 3, 1980, 1386
Int. Cl.^{3} C09B *23/00, 25/00*
U.S. Cl. 542—439 11 Claims

1. A compound of the formula (I*a*)



wherein

R^1 is hydrogen or lower alkyl;

R^4 is nitro, amino, trifluoromethyl, lower alkyl or lower alkoxy; and

R^5 is hydrogen or lower alkylcarbonyl; or a pharmaceutically acceptable acid accition salt thereof.

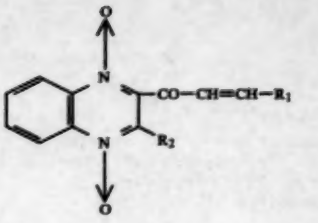
4,373,101

QUINOXALINE-2-YL ETHENYL KETONES

Pal Benkö; Daniel Bozsing; Janos Gundel, and Karoly Magyar, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Jun. 2, 1981, Ser. No. 269,721
Claims priority, application Hungary, Jun. 3, 1980, 1385/80
Int. Cl.^{3} C09B *55/00*
U.S. Cl. 542—440 8 Claims

1. A compound of the formula (I)



(I)

wherein

R_1 is phenyl, alpha-naphthyl or beta-naphthyl, each of which is unsubstituted or substituted by halogen, hydroxy, C_1 to C_4 alkyl or C_1 to C_4 alkoxy, or R_1 is 6-benzo[1,3]dioxanyl, quinoxaline-2-yl-1,4-dioxide, or 3-pyridyl, each of which is unsubstituted or substituted by one or two C_1 to C_4 alkyl groups; and

R_2 is hydrogen or C_1 to C_4 alkyl.

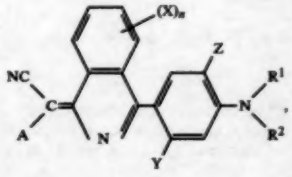
4,373,102

ISOINDOLINE DYES, THEIR PREPARATION AND USE

Peter Neumann, Wiesloch; Wolfgang Elser, Wachenheim; Gustav Bock, Neustadt, and Wolf-Dieter Kermer, Fussgoenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,156
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912428
Int. Cl.^{3} C07D *209/44, 401/10, 403/10, 413/10*
U.S. Cl. 544—143 21 Claims

1. A dye of the formula



wherein

A is cyano, carbo-C_1–C_4-alkoxy, acetyl, benzoyl, 4-nitrophenyl, 4-cyanophenyl, carbamyl, N-C_1–C_4-alkylcarbamyl, where alkyl is unsubstituted or substituted by C_1–C_4-alkoxy, or N-phenylcarbamyl, where phenyl is unsubstituted or substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy,

X is hydrogen, chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy, and if n is 2 the substituents may be identical or different,

n is 1 or 2,

R^1 is hydrogen, methyl, ethyl or 2-hydroxyethyl and

R^2 is phenyl which is unsubstituted or substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, or is cyclohexyl, or

R^1 is hydrogen and

R^2 is C_1–C_4-alkyl or

R^1 and R^2 are C_1–C_6-alkyl; C_1–C_4-alkyl substituted by chlorine, cyano, hydroxyl, C_1–C_4-alkoxy, phenoxy, C_2–C_5-alkanoyloxy (which may or may not be substituted by C_1–C_4-alkoxy or phenoxy) or carbo-C_1–C_4-alkoxy; allyl; or phenyl-C_1–C_4-alkyl or

is a saturated heterocyclic five-membered or six-membered ring which may additionally contain an oxygen or a further nitrogen as a ring member,

Y is hydrogen, hydroxyl, methyl or ethyl;

where R^3 is linear or branched C_1–C_{12}-alkyl or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy;

where R^4 is hydrogen or C_1–C_4-alkyl and R^5 is hydrogen, linear or branched C_1–C_{12}-alkyl, trifluoromethyl, chloromethyl, C_1–C_4-alkoxymethyl or phenoxymethyl (where phenoxy may or may not be substituted by one or two chlorine, methoxy, nitro or C_1–C_4-alkyl, and, in the case of two substituents, the substituents may be identical or different); phenylthiomethyl, where phenyl is unsubstituted or substituted by C_1–C_4-alkyl; benzyl; phenylethyl; C_3–C_7-cycloalkyl; phenyl which is unsubstituted or substituted by C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy or nitro; H_5C_6—CH=CH—; —CH_2—$PO(OR^6)_2$, where R^6 is C_1–C_4-alkyl, or

where R^4 has the above meanings and R^7 is C_1–C_{12}-alkyl, phenyl or C_1–C_{12}-alkylphenyl, or

Y is N-C_1–C_4-alkylamino, when R^1 and R^2 are C_1–C_4-alkyl or

Y is N,N-di-C_1–C_4-alkylamino, N-pyrrolidinyl, N-piperidinyl or N-morpholinyl when

is N,N-di-C_1–C_4-alkylamino, N-pyrrolidinyl, N-piperidinyl or N-morpholinyl, and

Z is hydrogen or, when R^1 and R^2 are C_1–C_4-alkyl or allyl and Y is

Z is hydrogen, methoxy or ethoxy.

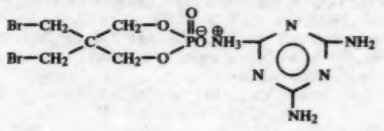
4,373,103

DIBROMONEOPENTYL PHOSPHATE MELAMINE SALT FLAME RETARDANT

Alfred K. Jung, Ridgewood; Joseph Silberberg, Brooklyn, and Edward D. Weil, Hastings-on-Hudson, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 5, 1980, Ser. No. 146,583
Int. Cl.[3] C07D 251/70; C07F 9/65, 9/09
U.S. Cl. 544—195 4 Claims

1. Dibromoneopentyl phosphate melamine salt represented by the formula:



said salt being a solid having a decomposition point of about 300° C.

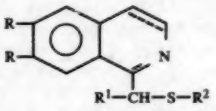
4,373,104

SULFUR-CONTAINING ISOQUINOLINE DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Kalman Takacs; Maria H. Papp; Gabor Kovacs; Ilona K. Ajzert; Antal Simay; Peter L. Nagy; Marian E. Puskas; Gyula Sebestyen; Istvan Stadler, and Zoltan Sümeghy, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara, Budapest, Hungary

Filed Jul. 1, 1980, Ser. No. 164,939
Claims priority, application Hungary, Feb. 7, 1979, CI 1944
Int. Cl.[3] C07D 217/14; A61K 31/47
U.S. Cl. 546—145 28 Claims

1. A compound of the formula (I)



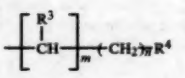
(I)

wherein

R is hydrogen, hydroxyl or C_1 to C_4 alkoxy;

R^1 is hydrogen, C_1 to C_4 alkyl, phenyl-C_1 to C_4 alkyl, phenyl, halo-phenyl or C_1 to C_4 alkoxy-phenyl;

R^2 is allyl, phenyl, halo-phenyl, C_1 to C_4 alkoxy-phenyl, carboxy-phenyl, or a group of the formula (A):



(A)

wherein

R^3 is hydrogen, C_1 to C_4 straight or branched chain alkyl, or phenyl;

m and n are each 0, 1 or 2 and m+n is at least 1; and

R^4 is hydrogen, phenyl, hydroxyl, acetoxy, carboxyl, C_1 to C_6 alkoxycarbonyl, carbamoyl, carbazoyl, or dialkylamino having 1 to 6 carbon atoms in each alkyl moiety; and

the dotted line stands for a further carbon-carbon bond or a hydrogen atoms in each of the 3- and 4-positions of the ring, or a pharmaceutically effective salt thereof.

4,373,105

M-ANILIDE-URETHANES

Wolfgang Rohr, Mannheim; Ulrich Schirmer, Heidelberg, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

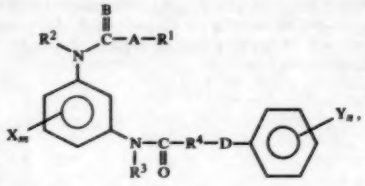
Continuation of Ser. No. 86,134, Oct. 18, 1979, abandoned. This application Mar. 11, 1981, Ser. No. 242,558

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846625

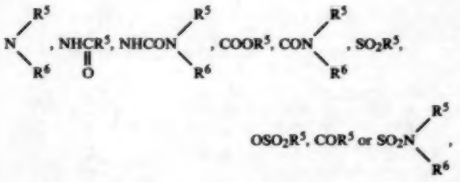
Int. Cl.³ C07C *155/08, 155/02, 155/03, 125/065*

U.S. Cl. 560—27 **3 Claims**

1. An m-anilide-urethane of the formula



where A and B are identical or different and each denotes oxygen or sulfur, and D is oxygen R^1 denotes unsubstituted alkyl; alkyl substituted by halogen, alkoxy, alkoxycarbonyl or cyano; unsubstituted or halogen-substituted alkenyl; unsubstituted or halogen- or alkoxy-substituted alkynyl; or R^1 denotes unsubstituted or alkyl-substituted cycloalkyl or aryl, R^2 and R^3 are identical or different and each denotes hydrogen, alkyl, alkoxyalkyl or haloalkyl, R^4 denotes alkylene of 1 to 6 carbon atoms which is unsubstituted or substituted by alkyl, alkoxyalkyl or haloalkyl, X denotes hydrogen, alkyl, haloalkyl, alkoxy, halogen, nitro or amino, Y denotes hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, aralkyl, halogen, or alkenyl chain fused with the benzene ring to give a bromo-substituted or unsubstituted naphthyl ring, Y further denotes alkoxy, haloalkoxy, alkylthio, nitro, aryl, thiocyanato, cyano,



R^5 and R^6 being identical or different and each denoting hydrogen or having the meanings given for R^1, m denotes one of the integers 1, 2, 3 and 4, and n denotes one of the integers 1, 2, 3, 4 and 5.

4,373,106

SULFAMOYL-SUBSTITUTED PHENETHYLAMINE DERIVATIVES AND PROCESS OF PRODUCING THEM

Kazuo Imai, Omiya; Kunihiro Niigata, Ageo; Takashi Fujikura, Urawa; Shinichi Hashimoto, Matsudo, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

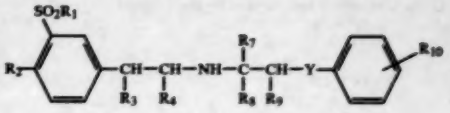
Filed Feb. 4, 1981, Ser. No. 231,421

Claims priority, application Japan, Feb. 8, 1980, 55-14382

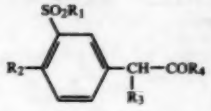
Int. Cl.³ C07C *143/80*

U.S. Cl. 564—85 **13 Claims**

1. A process for producing sulfamoyl-substituted phenethylamine derivatives represented by the formula

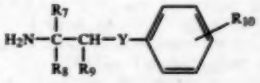


wherein R_1 represents an amino group or a mono- or di-lower alkylamino group; R_2 represents a hydroxyl group, a lower alkyl group, or a lower alkoxy group; R_3 represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a phenylthio group, or a phenylsulfinyl group; R_4, R_7, R_8 and R_9 each represent a hydrogen atom or a lower alkyl group; R_{10} represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group and Y represents an oxygen atom or a methylene group; said Y is an oxygen atom when R_2 is a hydroxyl group or the salts thereof which comprises condensing a compound represented by the formula



wherein R_1, R_2, R_3 and R_4 have the same significance as in the above formula

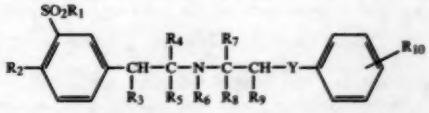
and a compound represented by the formula



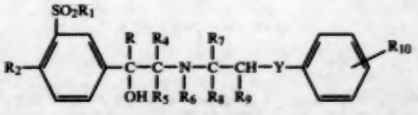
wherein R_7, R_8, R_9, R_{10} and Y have the same significance as in the above formula

and then reducing the condensation product.

2. A process for producing sulfamoyl-substituted phenethylamine derivatives represented by the formula

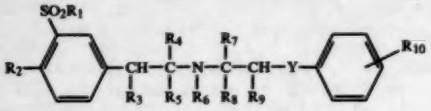


wherein R_1 represents an amino group or a mono- or di-lower alkylamino group; R_2 represents a hydroxyl group, a lower alkyl group or a lower alkoxy group; R_3 represents a chlorine or bromine atom; R_4, R_5, R_6, R_7, R_8 and R_9 each represent a hydrogen atom or a lower alkyl group; R_{10} represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group; and Y represents an oxygen atom or a methylene group; said Y being an oxygen atom when R_2 is a hydroxyl group, or the salts thereof which comprises reacting a compound represented by the formula

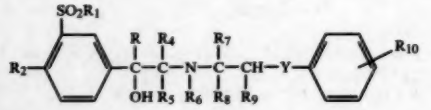


wherein R represents a hydrogen atom or a lower alkyl group and R_1, R_2, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and Y have the same significance as in the above formula with a chlorinating or brominating agent.

3. A process for producing sulfamoyl-substituted phenethylamine derivatives represented by the formula

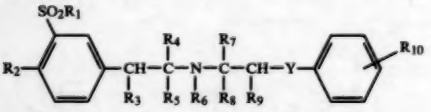


wherein R_1 represents an amino group or a mono- or di-lower alkylamino group; R_2 represents a hydroxy group, a lower alkyl group or a lower alkoxy group; R_3 represents a hydrogen atom or a lower alkyl group; R_4, R_5, R_6, R_7, R_8 and R_9 each represent a hydrogen atom or a lower alkyl group; R_{10} represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group; and Y represents an oxygen atom or a methylene group; said Y being an oxygen atom when R_2 is a hydroxyl group, or the salts thereof which comprises reacting a compound represented by the formula

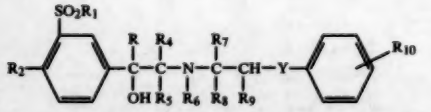


wherein R represents a hydrogen atom or a lower alkyl group and R_1, R_2, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and Y have the same significance as in the above formula with a halogenating agent and reducing the halogenated product.

10. The process for producing sulfamoyl-substituted phenethylamine derivatives represented by the formula



wherein R_1 represents an amino group or a mono- or di-lower alkylamino group; R_2 represents a hydroxyl group, a lower alkyl group or a lower alkoxy group; R_3 represents phenylsulfinyl; R_4, R_5, R_6, R_7, R_8 and R_9 each represent a hydrogen atom or a lower alkyl group; R_{10} represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group; and Y represents an oxygen atom or a methylene group; said Y being an oxygen atom when R_2 is a hydroxyl group, or the salts thereof which comprises reacting a compound represented by the formula



wherein R represents a hydrogen atom or a lower alkyl group and R_1, R_2, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and Y have the same significance as in the above formula with a halogenating agent to form a halogenated product, reacting said halogenated product with an alkaline material, reacting the product thus obtained with thiophenol, and oxidizing the resulting product.

4,373,107

PROCESS FOR PREPARING N-ALKYL-ALKYLENE-DIAMINES

Susumu Tahara; Keigo Nishihira; Takashi Miyatake; Hiroyuki Sawada, all of Ube, and Junichiro Kita, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jul. 22, 1981, Ser. No. 286,030
Claims priority, application Japan, Aug. 13, 1980, 55/111590
Int. Cl.³ C07C *85/08*
U.S. Cl. 564—473 13 Claims

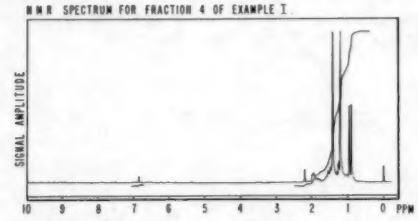
1. In the process for preparing an N-alkyl-alkylene-diamine by contacting an alkylene diamine with an aliphatic aldehyde in a reaction solvent in the presence of hydrogen under pressure and a platinum group metal, the improvement which comprises gradually adding the aliphatic aldehyde to the alkylene diamine in the absence of an alkalene substance other than said diamine.

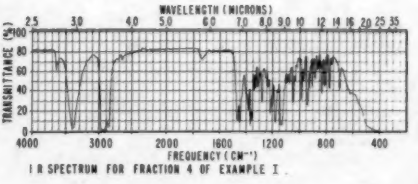
4,373,108

BRIDGED TRICYCLIC ALCOHOL, PROCESS FOR PREPARING SAME AND PERFUMERY USE THEREOF

Kenneth K. Light, North Ogden, Utah; Joseph A. McGhie, Montclair, N.J.; Futoshi Fujioka, Wanamassa, N.J., and Takao Yoshida, West Long Branch, N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

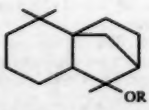
Continuation-in-part of Ser. No. 206,649, Nov. 13, 1980. This application Jul. 29, 1981, Ser. No. 287,939
Int. Cl.³ C07C *35/22*
U.S. Cl. 568—817 3 Claims





I R SPECTRUM FOR FRACTION 4 OF EXAMPLE I.

1. The tricyclic compound defined according to the structure:



wherein "R" is hydrogen or lithium.

4,373,109

BIFUNCTIONAL ACID-BASE CATALYZED CONVERSION OF HETERO-SUBSTITUTED METHANES INTO OLEFINS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Filed Aug. 5, 1981, Ser. No. 290,292
Int. Cl.³ C07C 1/00
U.S. Cl. 585—640 17 Claims

1. A process for the conversion of heterosubstituted methanes at a temperature of about 250° to 400° C. over a heterogeneous supported bifunctional acid-base catalyst comprising a halide, oxyhalide, oxide, sulfide or oxysulfide of a transition metal of Groups IV, V, VI, VIII of the Periodic Table supported on an acidic chalcogenide to produce a hydrocarbon mixture of predominantly lower C_2 to C_5 olefins.

4,373,110

HF ALKYLATION PROCESS AND APPARATUS

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1981, Ser. No. 226,589
Int. Cl.³ C07C 2/56, 2/58, 2/62
U.S. Cl. 585—719 30 Claims

1. A process comprising:

(a) providing a reaction mixture comprising hydrogen fluoride, isoparaffin, and the reaction products of isoparaffin and olefin in the presence of hydrogen fluoride;

(b) separating the reaction mixture into a first phase containing hydrocarbon as its major component and a second phase containing hydrogen fluoride as its major component and polymeric material as a minor component;

(c) withdrawing from the first phase a first stream containing hydrocarbon as its major component;

(d) withdrawing from the second phase a second stream containing hydrogen fluoride as its major component and polymeric material as a minor component;

(e) fractionating directly at least a portion of the second stream to form a third stream containing polymeric material as its major component;

(f) combining at least a portion of the third stream with at least a portion of the first stream, wherein the first stream is withdrawn from a first phase which was separated from the same or a different reaction mixture as the second phase; and

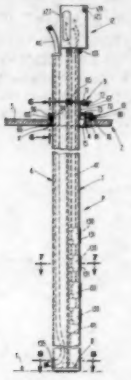
(g) separating from the combined at least a portion of the first stream and the at least a portion of the third stream a fourth stream containing the reaction products of isoparaffin and olefin as its major component.

4,373,111

SERVICE POLES

John L. Myers, Parkersburg; Richard D. Benscoter, Vienna, both of W. Va.; Bruce B. Chambers, Belpre, and Ralph E. Dyar, Marietta, both of Ohio, assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Apr. 21, 1980, Ser. No. 141,963
Int. Cl.³ H02G 3/04
U.S. Cl. 174—48 3 Claims



1. A service pole for supplying power and/or telephone outlets in a room of a building structure, the pole being adapted to extend between the floor and the ceiling of a room and the ceiling being the suspended type having means for supporting ceiling panels, the pole comprising:

an elongated, extruded aluminum frame formed with a pair of back-to-back channels, each channel having a base and a pair of spaced-apart parallel side walls extending away from the base and forming an opening, the respective openings facing outwardly in opposite directions and the base of each channel being common to one another;

in each channel, the inside of each side wall having an inner slot located adjacent the base to provide for flexing of the side wall, an outer slot located closely adjacent the outer end of the wall for use in mounting a cover for the channel and an intermediate slot being inboard of the second slot being for use mounting a receptacle retainer, the respective inner, outer and intermediate slots facing one another;

a pair of covers respectively removably mounted on said side walls and extending across the openings of said channels to close off the same and each said opening providing access to its channel with the cover removed and the channels and covers forming elongated compartments for carrying electrical conductors; and

each cover being removably mounted on the outer ends of the side walls by a pair of fingers disposed on the inside of the cover adjacent opposite edges and respectively engaged with the inside of said side walls and with said outer slots, the transverse dimension between the fingers being greater than the distance between the side wall whereby the side walls are outwardly flexed and provide inwardly directed force on the fingers for holding the cover in place.

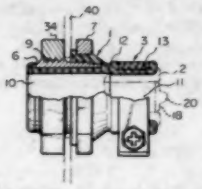
4,373,112

CABLE HOLDER

Akira Mizuno, Fujisawa, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 235,161
Int. Cl.³ H02G 3/18
U.S. Cl. 174—65 R 3 Claims

1. A cable holder comprising a mounting body provided with a hollow cylinder, an insertable member having a flange on one end which can be slid into the cylinder through the cable-receiving end of the cylinder up to the point of said flange, and a clamper for clamping the part of the mounting body through which the insertable member is to be slid, said insertable member and the inner surface of said cylinder being made of an electrically insulating, resilient plastic material, wherein the part of the cylinder through which the insertable



member is to be slid has an inside diameter smaller than that of the other part of the cylinder, forming a step on the boundary of the two parts of the cylinder, the other end of the insertable member being provided with a ring and inwardly adjacent annular groove, the diameter of said ring being slightly larger than the outer diameter of the insertable member and being equal to the inside diameter of the larger part of the cylinder.

4,373,113

HIGH-VOLTAGE POLYMERIC INSULATOR WITH SHEATH OF ELASTIC AND RIGID SEGMENTS AND METHOD OF MAKING SAME

Jerzy Winkler, and Jerzy Stankiewicz, both of Wroclaw, Poland, assignors to Instytut Elektrotechniki Oddzial Technologii i Materialoznawstwa Elektrotechnicznego, Wroclaw, Poland

Filed Sep. 11, 1980, Ser. No. 186,296
Claims priority, application Poland, Sep. 15, 1979, 218354
Int. Cl.³ H01B 17/02, 19/00
U.S. Cl. 174—179 5 Claims

1. A high-voltage outdoor polymeric insulator comprising:

(a) a prefabricated rod of alkaline-free continuous glass filaments impregnated with epoxy resin, the ends of the rod being pressed into end fittings;

(b) at least two spacing sleeves made of elastic material and having a bead at each end of each spacing sleeve;

(c) an externally profiled sleeve made of rigid material and positioned between each two of said spacing sleeves so as to form alternating elastic and rigid segments of insulating sheath around said rod and to partly cover both spacing sleeves; wherein at least the bead at the end of each spacing sleeve is covered by the adjacent profiled sleeve, said bead interlocking with said profiled sleeve so as to preclude slippage of said profiled sleeve relative to said spacing sleeve; and wherein the bead at the end of a spacing sleeve adjacent to an end fitting interlocks with said end fitting.

5. A method of making a high-voltage outdoor polymeric

insulator having a sheath mounted onto a prefabricated glass-fiber rod comprising the steps of:

(a) first, surface-treating said rod with a silane adhesive agent;

(b) second, casting silicone rubber spacing sleeves with beads at the ends of said spacing sleeves, directly onto the rod at selected intervals by pressure-injection; and

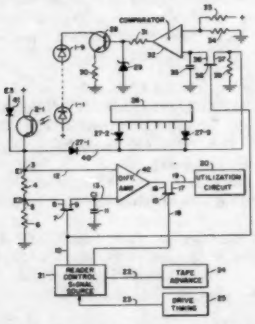
(c) third, casting profiled sleeves in the spaces between said spacing sleeves so as to cover said beads and interlock therewith, said casting being carried out in a split mold by injection, wherein the material of said profiled sleeves is a cast epoxy composition consisting of cycloaliphatic epoxy resin, anhydride hardener, and an inorganic fille:.

4,373,114

METHOD AND MEANS OF READING PUNCHED DATA TAPE

Wayne R. Herbst, Northbrook, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Aug. 6, 1979, Ser. No. 64,257
Int. Cl.³ G06K 7/10; G08C 9/06
U.S. Cl. 178—17 D **3 Claims**



1. An arrangement for reading data stored in punched data tape which has a plurality of data positions along the length of the tape and webs of unpunched areas joining the successive data positions comprising: means for defining a reading position, means for periodically advancing the tape such that the data locations of the tape are brought into registration with said reading position; a source of light arranged to impinge upon the portion of said tape in said reading position, a light sensor assembly at said reading position to receive from said source light which passes through said tape, and means for generating output signals defining the presence and absence of holes at the data locations of said tape;

CHARACTERIZED IN THAT:

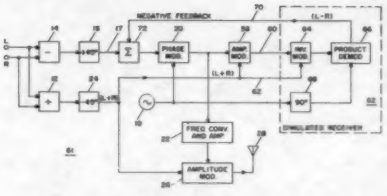
said means for generating output signals comprises: a voltage divider for generating first and second voltage signals each proportional to the amount of light impinging upon a corresponding light sensor, said second potential being less than said first potential; means for generating a Sample Hold signal when a data location of the punched data tape is in said reading position and a Go signal when a web portion of the tape is in said reading position, means for storing an analogue voltage signal, a first connecting means responsive to said Sample Hold signal for connecting the second voltage signal of said voltage divider to said storing means; a differential amplifier for generating an output signal at an output terminal thereof in accordance with the magnitudes of voltages applied to first and second input terminals thereof; means connecting the first voltage signal of said voltage divider to the first input terminal of said differential amplifier; and means connecting said storing means to the second input terminal of said differential amplifier; a utilization circuit for utilizing information obtained from said punched data tape, and a second connecting means responsive to said Go signal for connecting the output of said differential amplifier to the said utilization circuit when the input to the first input terminal of said differential amplifier is a first voltage signal corresponding to the opacity of the web immediately following a data location and the input to the second terminal of said differential amplifier is a second voltage signal from said storage means.

4,373,115

PREDICTIVE DISTORTION REDUCTION IN AM STEREO TRANSMITTERS

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed Aug. 18, 1980, Ser. No. 179,327
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GS **13 Claims**



1. In apparatus for generating a composite AM stereo radio broadcast signal comprising a main carrier signal amplitude modulated with stereo sum information and angle modulated with stereo difference information, the improvement comprising:

means, including a simulated stereo receiver, for developing at the output of said simulated receiver a signal representing a prediction of the distortion which may arise from the transmission and reception of said composite signal and the demodulation of the angle-modulation component thereof;

and means for directly combining said predictive signal with a supplied stereo difference information bearing signal, to produce a modified stereo difference information bearing signal, for use in angle modulating a secondary carrier which is related to said main carrier, thereby to reduce said distortion.

4,373,116

VOICE TRIP INFORMATION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Michiro Shimizu, Yokohama, and Masakazu Tsunoda, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 3, 1980, Ser. No. 193,815
Claims priority, application Japan, Oct. 4, 1979, 54-127353
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SM **7 Claims**

1. A voice trip information system for an automotive vehicle provided with an engine, which comprises:

(a) an ignition switch for outputting an ignition-on signal S_{ig} when turned on and an ignition off-signal when turned off;

(b) a speed sensor for detecting vehicle speed and for outputting a vehicle speed signal S_V;

(c) a fuel sensor for detecting an amount of fuel and for outputting a fuel amount signal S_f;

(d) a clock oscillator for outputting a clock signal S_c;

(e) an interface including interconnected waveform shapers, dividers, A-D converters, a multiplexer and latch circuits, said interface being connected to said ignition switch, said speed sensor, said fuel sensor, and said clock oscillator for waveform shaping the vehicle speed signal S_V to a rectangular pulse signal, dividing the shaped vehicle speed signal

S_V into one pulse per predetermined distance to obtain a distance signal, converting the fuel amount signal S_f into a frequency signal corresponding thereto, and sequentially transferring the signals input thereto in a time-shared sequence;

(f) a voice synthesizing system including:

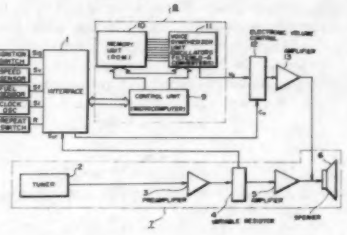
(1) a voice synthesizer;

(2) a memory unit connected to said voice synthesizer for temporarily storing voices synthesized thereby; and

(3) a control unit connected to said interface, said voice synthesizer and said memory unit, said control unit formed by a microcomputer having a central processing unit, a read only memory for storing programs and fixed data, and a random access memory;

(g) said control unit including means for outputting

first command signals, in response to the ignition-on signal S_{ig}, to said interface to read the vehicle speed signal S_V, the fuel amount signal S_f and the clock signal S_t, for storing of these signals as initial basic data,



second command signals, in response to the ignition-off signal, to said interface to read the current vehicle speed signal S_V, the current fuel amount signal S_f and the current clock signal S_t, for calculating travel time based on the initial and current clock signals S_t; travel distance based on the distance signal obtained from the vehicle speed signals S_V; fuel consumed based on the initial and current fuel amount signals S_f; and fuel consumption rate based on the calculated travel distance and fuel consumed; and

third command signals to said voice synthesizer to determine a plurality of voice messages in accordance with the obtained travel time, travel distance, fuel consumed and fuel consumption rate and to output each of determined voice form messages after having temporarily stored each in said memory unit,

whereby travel time, travel distance, fuel consumed and fuel consumption rate are indicated, in voice form, when said ignition switch is turned off.

4,373,117

DC TO DC CONVERTER FOR LINE POWERED MODEM

O. Leon Pierce, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Nov. 3, 1980, Ser. No. 203,109

Int. Cl.³ H04M *19/00*

U.S. Cl. 179—2 DP **10 Claims**

1. A telephone line powered modem comprising:

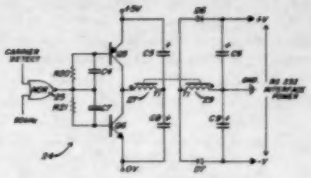
a transmitter operative in response to data from a source to provide modulated data signals to the telephone line;

a receiver operative to provide data signals derived from signals received on the telephone line;

a power source operative in response to telephone line power to provide operating power for the transmitter and receiver while maintaining the current drawn from the telephone line and the voltage drop across the telephone line within specified limits;

an output interface coupled to the receiver and operative to provide output signals compatible with utilization equipment coupled to the modem output; and

converter means including a source of unbalanced square wave signals energizing the converter operative to provide predetermined unbalanced output voltages for operation of the output interface.



4,373,118

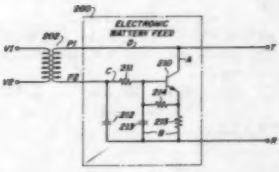
BATTERY FEED CIRCUIT

Richard James Cubbison, Jr., Littleton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 8, 1981, Ser. No. 271,604

Int. Cl.³ H04M *19/00*

U.S. Cl. 179—77 **9 Claims**



1. An electronic battery feed circuit (200) for interfacing one winding of a voice transformer (202) having first (P1) and second (P2) terminals with first (T) and second (R) leads respectively of a communication pair, comprising:

dc blocking means (212) connected between said second terminal (P2) of said voice transformer (202) and said second lead (R) of said communication pair for providing a low ac impedance and high dc impedance path therebetween;

connecting means (D) for directly connecting said first terminal (P1) of said voice transformer (202) to said first lead (T) of said communication pair;

current sink means (210, 211, 213–215) having input (A) and output (B) terminals connected respectively to said first (T) and said second (R) leads of said communication pair, and having a control terminal (C) wherein said current sink means (210, 211, 213–215) is responsive to the application of a bias current to said control terminal (C) for providing a low dc impedance, high ac impedance path between said input (A) and said output (B) terminals; and

wherein said control terminal (C) is directly connected to said second terminal (P2) of said voice transformer (202) for obtaining said bias current from said voice transformer (202).

4,373,119

ADJUSTABLE TRANSDUCER

Alvin Feder, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1980, Ser. No. 213,425

Int. Cl.³ H04R *17/00*

U.S. Cl. 179—110 A **6 Claims**

1. An adjustable transducer apparatus comprising:

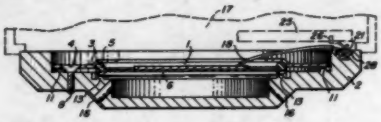
a saucer-shaped housing with two inner concentric ridges;

a planar cover plate, the outer rim of which rests on the outer ridge of the two concentric ridges;

a metal plate;

a transducer element fixedly mounted on the center of the metal plate, the rim of said metal plate resting on the inner ridge of the two concentric ridges;

an "O" ring disposed in the housing between the planar cover plate and the metal plate and opposite the inner ridge for holding the metal plate against the housing; and



a plurality of screws for adjustably fastening the planar cover plate against the housing at intermediate points between the outer and inner ridges so that the planar cover plate is pivoted about the outer ridge to produce compression on the "O" ring and said "O" ring transmitting pressure to the metal plate of the transducer, wherein the alertness of the transducer is obtained by adjusting the screws.

4,373,120

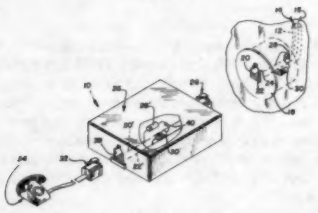
LINE TEST TERMINATION DEVICE

Gerald F. McDonald, Babylon, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,680

Int. Cl.³ H04M *1/24*

U.S. Cl. 179—175 **9 Claims**



1. A line test termination device for providing a characteristic signature to the telephone central office when a continuity test is made on a subscriber line having a pair of electrically conductive paths comprising:

(a) a resistor;

(b) a diode connected in series with said resistor from one of said electrically conductive paths to the other of said electrically conductive paths; and

(c) a housing adapted to receive a telephone instrument plug therein and continue the electrically conductive paths to said telephone instrument, said resistor and said diode being disposed in said housing.

4,373,121

MAINTENANCE TERMINATION DEVICE

Eugene F. Sartori, Madison, and Francis J. Uhrhane, Cedar Knolls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

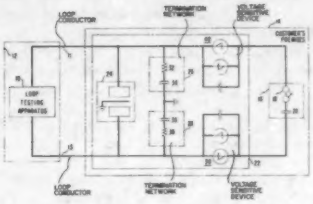
Filed Jun. 15, 1981, Ser. No. 273,975

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 F **9 Claims**

1. A fault locating circuit (22) in a subscriber loop comprising a plurality of conductors (11,13) connecting a central office (12) with terminal equipment (16) for determining whether said fault is located on the central office side or the terminal equipment side of said locating circuit, said locating circuit comprising

a plurality of voltage sensitive devices (30,40), each of said voltage sensitive devices being connected in series with one of said loop conductors between said central office and said terminal equipment, and



a termination network comprising a plurality of substantially identical impedance termination networks (26,28), each of said impedance termination networks being connected permanently between different ones of said subscriber loop conductors (11,13) and ground on the central office side of said plurality of voltage sensitive devices.

4,373,122

CAPACITANCE SWITCH

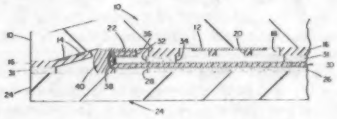
Norman J. Frame, Whitefish Bay, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Continuation-in-part of Ser. No. 237,098, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 228,118, Jan. 26, 1981. This application Oct. 16, 1981, Ser. No. 311,915

The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.

Int. Cl.³ H01H *9/00, 13/02*

U.S. Cl. 200—159 B **5 Claims**



1. A membrane capacitance switch wherein switch activation produces a change in capacitance detectable by external circuitry, comprising:

a substrate sheet,

a flexible sheet extending over said substrate sheet,

a conductive contact carried by one of said substrate sheet and said flexible sheet,

a capacitance element located between said substrate sheet and said flexible sheet and aligned with said contact,

said capacitance element comprising

an inner insulating layer and

first and second outer conductive portions on opposite surfaces of said inner insulating layer,

said capacitance element forming a first capacitor,

spacing means for spacing said capacitance element from said contact so as to provide an insulating zone between said contact and said first conductive portion,

said contact, insulating zone, and first conductive portion being adapted to form a second capacitor electrically in series with said first capacitor,

said flexible sheet, spacing means, contact, and first conductive portion all being adapted and located to cause the spacing between said contact and first conductive portion to vary when said flexible sheet is flexed during switch activation and to thereby cause the net capaci-

tance of said first and second capacitors to change to an extent detachable by external circuitry,

said spacing means including a spacer layer occupying the space between said flexible layer and said capacitance element, and

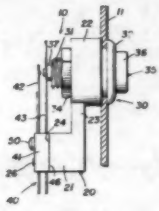
said capacitance spacing element being bent around said spacer in a fold portion at an end thereof.

4,373,123

STUDDED MOUNTING STRUCTURE FOR SWITCH

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Apr. 12, 1982, Ser. No. 367,290
Int. Cl.³ H01H *1/26, 13/52*
U.S. Cl. 200—159 A **7 Claims**



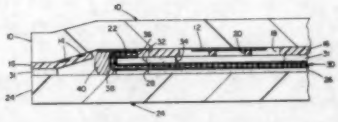
1. The combination comprising mounting structure including a block of unitary one-piece construction having a neck with a mounting collar at the distal end thereof and a block surface and a block bore extending into said block surface and a stud protruding from said block surface, the axes of said block bore and said stud being substantially parallel; a leaf spring switch having a body and first and second elongated leaf springs carried thereby, said body having a body surface and a pair of substantially parallel body bores spaced apart a distance equal to the distance between said stud and said block bore, said surfaces being in juxtaposition, with said stud extending into one of said body bores; and a threaded fastener extending through the other of said body bores into said block bore.

4,373,124

CAPACITANCE SWITCH

Norman J. Frame, Whitefish Bay, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Continuation of Ser. No. 237,098, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 228,118, Jan. 26, 1981. This application May 11, 1982, Ser. No. 377,264
The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.
Int. Cl.³ H01H *9/00, 13/02*
U.S. Cl. 200—159 B **3 Claims**



1. A capacitance switch wherein switch activation produces a change in capacitance detectable by external circuitry, comprising:

a substrate,

a movable layer extending over said substrate,

a plurality of conductive contacts carried by one of said substrate and said movable layer, said contacts defining a plurality of switch zones,

a capacitance element located between said substrate and said movable layer and extending through said plurality of switch zones,

said capacitance element comprising

an inner insulating layer and

first and second outer conductive portions on opposite surfaces of said inner insulating layer,

said capacitance element forming a first capacitor,

spacing means for spacing said capacitance element from each said contact so as to provide insulating zones between each said contact and said first conductive portion,

said contacts, insulating zones, and first conductive portion being adapted to form a plurality of second capacitors each electrically in series with said first capacitor,

said movable layer, spacing means, contacts, and first conductive portion all being adapted and located to cause the spacing between a selected said contact and first conductive portion to vary when said movable layer is moved during switch activation and to thereby cause the net capacitance of said first capacitor and the selected second capacitor to change to an extent detectable by external circuitry, and

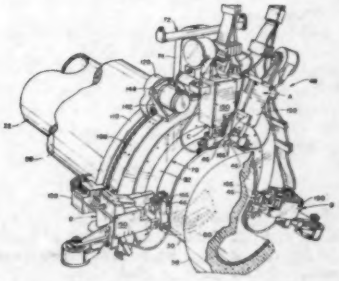
said spacing means including one or more spacing elements occupying the space between said movable layer and said capacitance element.

4,373,125

APPARATUS FOR WELDING PIPES

Gasparas Kazlauskas, North Hollywood, Calif., assignor to Astro-Arc Company, Sun Valley, Calif.

Filed Jul. 22, 1977, Ser. No. 817,999
Int. Cl.² B23K *37/02*
U.S. Cl. 219—60 A **6 Claims**



1. An automatic pipe welder comprising:

guide means adapted to be fixedly secured to a pipe assembly;

a carriage assembly connected to said guide means, said carriage assembly including a first carriage and a second carriage located in a spaced apart arrangement, both said first carriage and said second carriage being movable in respect to said guide means;

motor means interconnecting said guide means and said carriage assembly for moving said first and said second carriages, a driving means connected to said guide means and located between said first carriage and said second carriage, said motor means connected with said driving means;

welding torch means connected to said carriage assembly, said welding torch means including a first torch assembly and a second torch assembly, said first torch assembly being connected to said first carriage, said second torch assembly being connected to said second carriage, said

first torch assembly being movable in a one hundred and eighty degree arc with said second torch assembly being movable in a separate one hundred and eighty degree arc and both said arcs being in the same plance thereby forming a continuous circle; upright post means located between said first carriage and said second carriage, said driving means comprising a driving chain attached to said upright post means.

4,373,126

PROCESS FOR ELIMINATING ERRORS IN PREPOSITIONING PIECES TO BE MANUFACTURED BY ELECTRO-EROSION

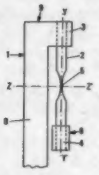
Franz Schilling, Saint Remy les Chevreuse, France, assignor to Sfena, Velizy Villacoublay, France

Filed Jan. 3, 1980, Ser. No. 110,111

Claims priority, application France, Jan. 11, 1979, 79 00601

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 M **6 Claims**



1. A process for forming an integral hinge in the form of a flexible suspension blade in a rod by electro-erosion machining, said rod attached at one end thereof to a frame having three plane surfaces disposed at right angles to one another, comprising the steps of positioning curved electro-erosion electrodes accurately by means of coordinates formed with respect to said plane surfaces and,

repeatedly eroding the rod alternately on two opposite sides symmetrically disposed about the axis of the rod so that the rod becomes progressively narrowed at this point in the form of two opposing inwardly curved indentations until the required thickness of the hinge is obtained wherein said integral hinge is formed at a portion alcng the length of the rod.

4,373,127

EDM ELECTRODES

Thomas E. Haskett, Oakdale, and Joseph J. Schmitt, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1980, Ser. No. 119,164

Int. Cl.³ B23P *1/08, 1/04*

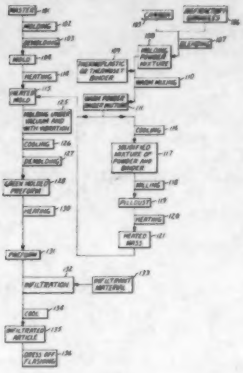
U.S. Cl. 219—69 E **19 Claims**

1. A shaped, electrical discharge machining electrode, consisting essentially of:

(1) a monolithic skeleton consisting essentially of (a) granules of carbon and (b) granules of a refractory material selected from the group consisting of tungsten, molybdenum, carbides of these two metals and stoichiometric and hyperstoichiometric carbides of the other elements of groups IVB, VB, and VIB of the Periodic Table of the Elements, the majority of said carbon granules being greater than about one micrometer in mean diameter, said refractory material being wettable by molten copper or silver, said carbon granules and said refractory granules being interconnected at their contiguous points of contact; and

(2) a continuous phase consisting essentially of copper, silver, or alloys containing copper or silver, and occupying the connected porosity in said skeleton;

wherein the volume percent of said carbon, said refractory, and said continuous phase are on or within the boundaries DEFG of FIG. 7, and the fraction expressed by the formula



$$\frac{(\text{volume \% } C)(\text{surface area } C)}{(\text{volume \% } R)(\text{surface area } R)}$$

wherein C is said carbon, R is said refractory, the volume percent terms are the fraction of said electrode occupied by C or R, and the surface area terms are the surface areas in m^2/g of said carbon or refractory granules measured before said carbon or refractory granules are used in making said electrode, is less than about 75, said electrode thereby being a monolithic structure consisting essentially of two intermeshed matrices, being substantially free of voids, and being substantially free of materials which are soluble in said continuous phase and reactive with carbon.

4,373,128

METHOD OF ELECTROSLAG SURFACING OF COMPONENTS HAVING A CYLINDRICAL SURFACE

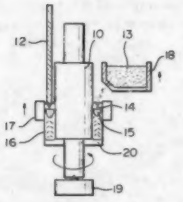
Yoshihiko Asai; Masao Hori, both of Kitakyushu, and Naoki Tokumitsu, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,725

Claims priority, application Japan, Dec. 29, 1979, 54-172596; Aug. 12, 1980, 55-109873

Int. Cl.³ B23K *9/04, 25/00*

U.S. Cl. 219—73.11 **11 Claims**



1. A method of surfacing a metal component having a cylindrical surface by an electroslag surfacing method, comprising:

placing the component in a vertical position;

placing a mold member around the lower end of the component with the inner surface of the mold spaced a distance from the cylindrical surface of the component to define a gap equal to the thickness of the surfacing;

forming a molten metal pool having a metal composition of

the metal to be applied to the component between the mold member and the cylindrical surface with a slag layer over the upper surface of the pool;

inserting a plurality of consumable electrodes each having a composition corresponding to the metal to be applied to the component and each of which is in the form of a bar having a large cross-section into the molten metal pool and spaced between the mold member and the cylindrical surface and at intervals in the circumferential direction of the mold;

supplying a multi-phase alternating current power to said electrodes and said component;

while thus supplying power, raising the mold, the molten metal pool and the electrodes vertically and parallel to the cylindrical surface and at the time rotating the component around the vertical cylindrical axis thereof; and

continuously adding molten metal having a composition corresponding to the metal to be applied to the component to the surface of the slag layer on the molten metal pool.

4,373,129

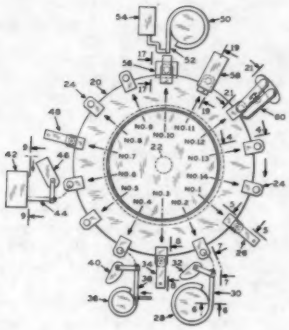
APPARATUS FOR ASSEMBLING AND WELDING VENTED CELL COVERS

Raymond K. Sugalski; Kenneth C. Leduc, both of Gainesville, and Jesse L. Morris, Archer, all of Fla., assignors to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 921,208, Jul. 3, 1978. This application Jul. 30, 1980, Ser. No. 173,868

Int. Cl.³ B23K *11/32*; B23P *21/00*

U.S. Cl. 219—79 **5 Claims**



1. An apparatus for assembling and welding into a composite unit the component parts of a vented cover for electrochemical cells, said apparatus including a carousel, receptacles fixed on said carousel, and stations around said carousel; means at respective ones of said stations for feeding to said receptacles the component parts of a cover to be assembled, one of said stations including means for forming a spring coil from wire fed to said station; said coil forming means comprising;

a coiling post;

means for retracting said coiling post upon the conclusion of a winding of a spring coil;

a chute disposed beneath said post and extending upwardly toward the site of said spring coil for contacting a base of said coil upon a retracting of said post, said coil dropping into said chute upon said retraction of said post;

said chute being curved for reorienting said coil from a horizontal orientation to a vertical orientation upon a feeding of said coil to said receptacle; and wherein

said apparatus further comprises a vacuum operated nozzle having an interior surface configured for mating with said spring coil, said coil being lifted from a receptacle and depositioned within a cover member by activation and release of vacuum; and means at a following station for welding the assembled component cover parts.

4,373,130

CONCEALED ELECTRIC HEATING ELEMENT ARRANGEMENT FOR VEHICLE WINDSHIELDS

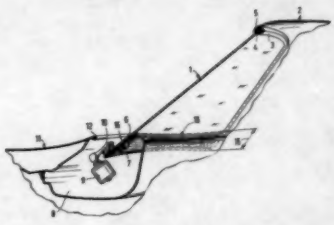
Gottfried Krasborn, Aachen; Paul Roentgen, Rott-Roetgen; Wilhelm Meier, Kohlscheid, and Josef Erdweg, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, France

Filed Jan. 21, 1980, Ser. No. 114,079

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902748

Int. Cl.³ H05B *3/26*; A47L *1/16*

U.S. Cl. 219—203 **14 Claims**



1. A windshield for motor vehicles characterized by a transparent panel defining a vehicle windshield having an upper region normally within the driver's field of vision and a lower region normally not within the driver's field of vision, an electric resistance heating means for heating said lower region, said heating means carried by said windshield only on said lower region, and a continuous layer of material opaque to ambient light and of a size at least coextensive with the area of said heating means within said lower region, said continuous layer also carried by said windshield in position so that said heating means is not visible from the front of said windshield, and said material being formed of a heat radiation absorbing substance.

4,373,131

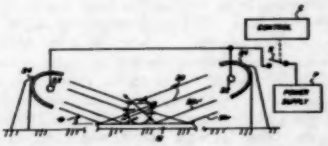
APPARATUS FOR FLASH FUSING TUNER IMAGES

Wei C. Lu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 189,492, Sep. 22, 1980, Pat. No. 4,341,854. This application Mar. 4, 1982, Ser. No. 354,877

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—216 **3 Claims**



1. Apparatus for fusing dry resinous marking particles on the surface of an energy reflective receiver member, said apparatus comprising:

means for producing radiant energy capable of at least partially melting said dry resinous marking particles;

means for supporting said radiant energy producing means with respect to said receiver member so that the radiant energy striking the marking particles and the receiver member from opposite sides is directed toward the surface

of said receiver member along a path having a major low-angle component relative to the receiver member; and

means for activating said radiant energy producing means to sufficiently irradiate a substantial portion of the surface area of the marking particles with radiant energy which has not been reflected by the receiver member and with radiant energy which has been reflected by the receiver member to fuse the marking particles to each other and to the surface of the receiver member.

4,373,132

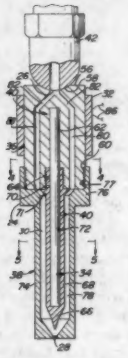
EXTERNAL/INTERNAL HEATER FOR MOLDING OF PLASTICS

Haig Vartanian, 817 Ashbourne Rd., Cheltenham, Pa. 19012

Filed Aug. 5, 1981, Ser. No. 290,140

Int. Cl.³ F27B *14/00*; B29F *1/03*

U.S. Cl. 219—421 **6 Claims**



1. A readily assemblable and disassemblable injection molding nozzle for carrying a viscous material to a mold and comprising a body, resistance heating means and elongated heat pipe means, said body having a longitudinal central axis and comprising a cylindrical shank member, a cylindrical bushing member and a cylindrical probe member, said shank member having an upper end including a central inlet located on said axis, said bushing member having a lower end including a central outlet located on said axis, said shank member being formed of a good thermally conductive material and having an outer sidewall surface, first passageway means in fluid communication with said inlet and disposed uniformly radially about said axis and second passageway means extending generally parallel to said axis and disposed at equadistantly spaced locations thereabout, said bushing member having a hollow interior portion and being releasably secured to said shank member, said probe member being connected to said shank member and having an elongated end portion disposed within the hollow interior of said bushing member to define an annular passageway therebetween, said annular passageway extending about said axis and being in fluid communication with said second passageway means and said outlet, said elongated heat pipe means being disposed along said axis and extending through said shank member and said probe member from a first point immediately adjacent said inlet to a second point immediately adjacent said outlet, with said first and second passageway means and said annular passageway means disposed uniformly about said heat pipe along its entire length, said resistance heating means comprising a band disposed about and secured to the outer sidewall surface of said shank member so that heat is conducted from said resistance heating means through said shank member to said heat pipe and therealong, whereupon when a viscous material is introduced into said inlet it flows for uniform distribution about said elongated heat pipe for heating thereby until said material exits said nozzle through said outlet.

4,373,133

METHOD FOR PRODUCING A BILL, APPARATUS FOR COLLECTING ITEMS, AND A SELF-SERVICE SHOP

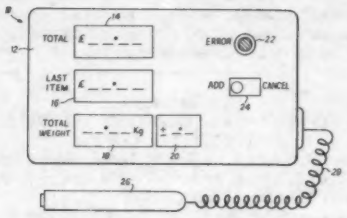
Nicholas Clyne, 152 Queen's Park Rd.; Philip L. Sturgeon, 58, Southdown Ave., and Lawrence H. Wright, 144 Tivoli Crescent North, all of Brighton, Sussex, England

Filed Dec. 30, 1980, Ser. No. 221,309

Claims priority, application United Kingdom, Jan. 3, 1980, 8000222

Int. Cl.³ G06F *15/84*; G06K *19/06*

U.S. Cl. 235—383 **5 Claims**



1. A self-service shop comprising

(a) a plurality of storage locations for items to be bought by customers,

(b) a plurality of movable receptacles for use by customers to form a collection of items to be bought by selection from said storage locations,

(c) a plurality of movable electronic recording units associated with said movable receptables, each said unit comprising (i) a memory store programmed, arranged and adapted to record at least data identifying the items selected by a customer for inclusion in said collection (ii) means for inputting to said recording unit information identifying the selected items, (iii) price summing means for summing, on the basis of the said information input into said electronic recording unit, the price of each selected item so as to provide an aggregate price indication for the collection and (iv) means for visually displaying said aggregate price indication to the customer while the collection is being formed,

(d) weight summing means for summing the gross weight of each selected item recorded in a said memory store to provide an aggregate gross weight indication for the collection, and

(e) at least one check-out station including means for weighing the collection of items made by a customer to provide a measured gross wieght indication for the collection, which can then be compared with the summed aggregate gross weight.

4,373,134

MAGNETIC CARD VOTE CASTING SYSTEM

Phillip F. Grace, 8701 Belleville Rd., Van Buren, Mich. 48111, and Howard A. Estes, Jr., 2523 Meade Ct., Ann Arbor, Mich. 48105

Filed May 6, 1981, Ser. No. 260,893

Int. Cl.³ G06K *3/00*; G07C *13/00*

U.S. Cl. 235—386 **4 Claims**

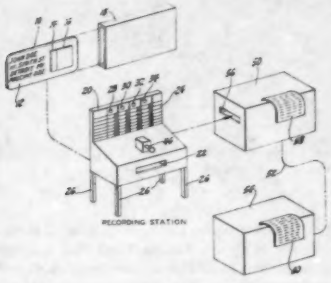
1. Voting apparatus, comprising:

a portable voter's registration card having magnetic means thereon and magnetically encoded voter identification on said magnetic means;

a recording machine having means for selectively magnetically recording a voter's selections on said magnetic means;

a vote-casting machine having a memory including means for receiving and supporting the card in a reading position and means for reading the vote selections into said memory;

said vote-casting apparatus having memory means having



stored therein a vote identification record for comparing information on the card and for rejecting the card if the identification record does not match with the identification information; and

means for producing a hard copy output compilation of the selections read by the vote-casting apparatus.

4,373,135

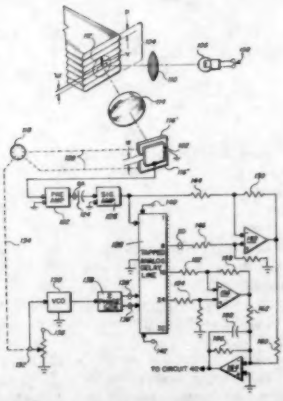
PITCH MATCHING DETECTING AND COUNTING SYSTEM

William L. Mohan; Samuel P. Willits, both of Barrington, and Thomas E. Kleeman, Elgin, all of Ill., assignors to Spartanics, Ltd., Rolling Meadows, Ill.

Filed Dec. 31, 1979, Ser. No. 108,548

Int. Cl.³ G06M 9/00

U.S. Cl. 377—8 **34 Claims**



1. Improved apparatus for counting the quantity of a plurality of similar objects stacked adjacent one another comprising

sensor means having an effective width less than the thickness of each of said similar objects, frame means supporting said sensor means for enabling relative movement at velocity v between said sensor means and said similar objects to thereby generate sensor output signals indicative of said quantity,

reference voltage source means having a variable output voltage,

adjustable clock means connected at its input to said reference voltage source means and responsive to the voltage thereof to generate clock pulses at its output whose frequency is a fixed multiple of sensor output counting data frequency,

discrete time processor means coupled at its input to the output of said sensor means and to said clock means and adapted to generate one or more synthesized output signals that are sequentially time delayed with respect to each other in accord with said clock pulses and proportional to said sensor output signals,

means for summing said synthesized output signals to provide summed outputs that are the equivalent to the outputs of one or more pitch-matched sensor means, and

signal processing and counting means connected to said summing means and responsive to the summed outputs therefrom to count said quantity of stacked objects.

4,373,136

FIRE AND EXPLOSION DETECTION

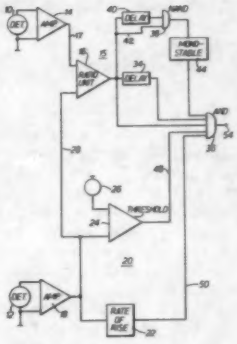
David N. Ball, Slough, England, assignor to Graviner Limited, High Wycombe, England

Filed Jul. 7, 1980, Ser. No. 166,559

Claims priority, application United Kingdom, Jan. 17, 1980, 8001655

Int. Cl.³ G01J 1/00

U.S. Cl. 250—339 **9 Claims**



6. A fire and explosion detection system for discriminating between radiation produced by a hydrocarbon fire or explosion and radiation produced by a metal fire, comprising

two radiation detecting means,

means operatively associated with the two radiation detecting means to constrain them to be respectively responsive to the intensity of radiation in different and spaced apart narrow wavelength bands whereby the radiation detecting means produce respective electrical outputs in dependence on the radiation received,

means responsive to at least one said electrical output to produce a first signal when at least one of the two parameters consisting of the intensity of the radiation received by the corresponding detecting means and the rate of rise of the intensity of the radiation received by the corresponding detecting means exceeds a predetermined value,

ratio means responsive to the two electrical outputs to measure the ratio of the intensities of the radiation respectively received by the two detecting means,

one said wavelength band including a wavelength at which there is a characteristic emission line of a hydrocarbon flame and low emission of radiation by a metal fire and the other said band including a wavelength at which there is a peak emission in the radiation of a metal fire and low emission of radiation by a hydrocarbon flame, whereby to maximise the difference between the said ratio as measured in the presence of a hydrocarbon fire and the said

ratio as measured in the presence of a metal fire, the ratio means being responsive to the said ratio to produce a second signal when the ratio indicates that the source of radiation is a metal fire, and

output means connected to receive the first and second signals and operative to produce a fire and explosion indicating output only when the first signal exists in the absence of the second signal.

4,373,137

RADIATION DETECTION AND RECEIVING IN NONDISPERSIVE INFRARED GAS ANALYZER

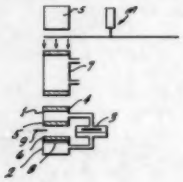
Walter Fabinski, Kriftel; Udo Deptolla, Ober-Olm, and Margareta Ascherfeld, Oberursel, all of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,115

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924843

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—343 **3 Claims**



1. In a nondispersive infrared gas analyzer having at least one path for a periodically interrupted beam of infrared radiation traversing a chamber for sample gas which contains a particular component to be detected as well as an interfering component, the analyzer further including a differential pressure-measuring chamber with capacitive pickup, one of the electrodes of the pickup being a flexible membrane partitioning the differential pressure-measuring chamber, the improvement comprising in combination:

a front detection chamber and a rear detection chamber disposed in said path downstream from said sample gas chamber and being serially traversed by radiation, the front chamber and rear chamber being connected to the differential measuring-chamber at opposite sides of the membrane, the front and rear chambers being filled with said particular component, one of the front and rear chambers containing a thin, nonfrequency-selective, absorbing element having a small heat capacity and intercepting a small portion of the radiation reaching the particular chamber in which it is contained.

4,373,138

HYBRID UNLATCHING FLIP-FLOP LOGIC ELEMENT

Theodore A. Fulton, Warren Township, Somerset County, and Arthur F. Hebard, Bernardsville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 974,376, Dec. 29, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 232,011

Int. Cl.³ H03K *3/38*

U.S. Cl. 307—277 **17 Claims**

1. A superconductive circuit comprising

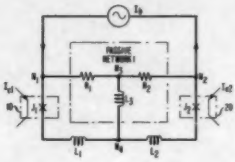
first and second Josephson junction latching gates (J_1, J_2) each having $V=0$ and $V\neq 0$ states, a critical current which when exceeded causes the gate to switch from its $V=0$ to its $V\neq 0$ state, and a drop-back level below which the gate switches from its $V\neq 0$ to its $V=0$ state,

electrode means (N_1, N_2) for applying DC bias current (I_b) to said gates,

control means (I_{c1}, I_{c2}) for selectively switching said gates from their $V=0$ to their $V\neq 0$ states,

one of said gates being initially set to its $V=0$ state and the other to its $V\neq 0$ state, CHARACTERIZED IN THAT said circuit is rendered unlatching by

a passive network (1, 3, 4, 5) coupling said gates to one



another and responsive to the switching of states of said one gate from its $V=0$ to its $V\neq 0$ state for applying a transient current to said other gate in a direction opposite to the direction said bias current flows therein and effective to reduce current in said other gate below the drop-back level thereof, thereby automatically resetting said other gate from its $V\neq 0$ to its $V=0$ state.

4,373,139

DETECTORS

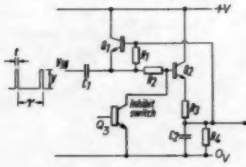
Graham E. Beesley, Basingstoke, England, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 17, 1980, Ser. No. 130,931

Claims priority, application United Kingdom, Apr. 30, 1979, 7914883

Int. Cl.³ G01R *19/02, 19/22, 23/09*

U.S. Cl. 307—350 **2 Claims**



1. An averaging detector for detecting RF signals with noise pulses comprising:

input means;

output means;

a first transistor;

a first resistor coupled between the emitter and base of the first transistor;

a second transistor;

a first capacitor for applying the RF signals with noise to the emitter of said first transistor and the base of said second transistor;

a first reference potential line coupled to the collector of said first and said second transistors;

the output means being coupled to the base of said first transistor;

a second resistor coupled between the emitter of said second transistor and said output means;

a second reference potential line;

a second capacitor and a third resistor connected in parallel and interposed between said second reference potential line and said output means, wherein all of the aforementioned resistors, capacitors and transistors are so chosen that, upon application of a voltage greater than the threshold of said first transistor, successive positive and negative-going cycles in the RF signal alternately reverse bias and forward bias said first and second transistors to

achieve a balance between the half cycle charging of the second capacitor through said second resistor and the continuous discharge of the second capacitor through said third resistor to provide a DC output voltage proportional to the average level of the waveform envelope of the RF signals at said input means.

4,373,140

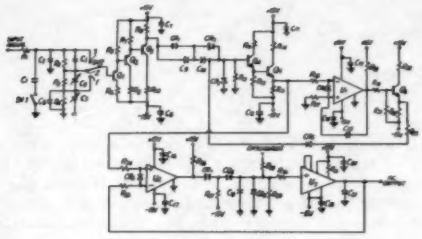
PEAK DETECTOR

Sze L. Chin, Lake Ronkonkoma, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 2,086, Jan. 9, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 205,907

Int. Cl.³ G01R *19/04*

U.S. Cl. 307—351 **34 Claims**



1. Apparatus for providing a direct current output voltage proportional to the peak to peak amplitude of an input signal comprising:

(a) signal processing means adapted to receive said input signal;

(b) direct current restoring means operatively connected to said signal processing means;

(c) peak detecting means responsive to said direct current restoring means; and

(d) first feedback means connected between the output of said direct current restoring means and the input to said direct current restoring means.

4,373,141

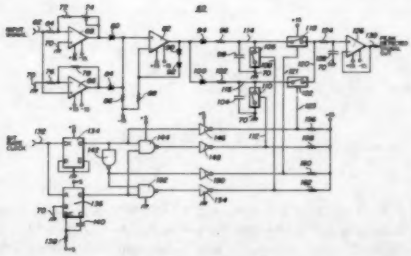
FAST UPDATING PEAK DETECTOR CIRCUIT

David E. Sanders, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jan. 22, 1981, Ser. No. 227,254

Int. Cl.³ H03K *5/153*; G11C *27/02*; G01R *19/04*

U.S. Cl. 307—351 **13 Claims**



1. A peak detector circuit, comprising:

means for rectifying an input signal to produce a rectified signal;

first means connected to receive said rectified signal for detecting and holding the peak amplitude of said rectified signal to produce a first peak signal;

second means connected to receive said rectified signal concurrently with said first means for detecting and holding the peak amplitude of said rectified signal to produce a second peak signal;

means for alternately connecting said first and second peak signals to an output terminal; and

means for alternately resetting said first and second peak signals to a preset level wherein each of said peak signals is reset when the other of said peak signals is connected to said output terminal.

4,373,142

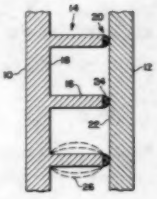
THERMIONIC ENERGY CONVERTERS

James F. Morris, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 19, 1981, Ser. No. 235,797

Int. Cl.³ H01J *45/00*

U.S. Cl. 310—306 **10 Claims**



1. In a cesium thermionic energy converter of the type comprising a diode having a pair of spaced electrodes with an interelectrode gap therebetween containing cesium wherein one of said electrodes is an emitter having a first elevated temperature and the other is a collector having a second elevated temperature lower than said first temperature, the improvement comprising

a plurality of minidiodes comprising protrusions of electrode material extending from the surface of one of said electrodes, said minidiodes being distributed in the interelectrode gap with the outermost ends thereof being adjacent to the other of said electrodes so that said minidiodes are in thermal communication with both said electrodes whereby the end of each minidiode adjacent to said collector is raised to said second temperature thereby readily adsorbing cesium and developing a low work function and the end of each minidiode adjacent to said emitter is raised to said first temperature thereby adsorbing less cesium and developing a high work function, and

means for electrically insulating said minidiodes from one of said electrodes whereby shorted-diode discharges are generated along said minidiodes to effectively ionize the cesium without electrically shorting said emitter to said collector.

4,373,143

PARAMETRIC DUAL MODE TRANSDUCER

Jan F. Lindberg, Norwich, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1980, Ser. No. 193,684

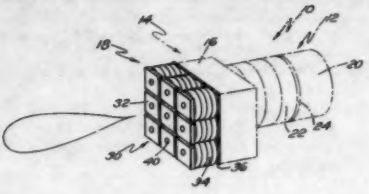
Int. Cl.³ H04B *13/00*

U.S. Cl. 310—334 **8 Claims**

1. A parametric dual mode transducer comprising:

first transducer means for converting an applied signal of a predetermined frequency; and

second transducer means for converting two applied signals having a difference frequency substantially the same as



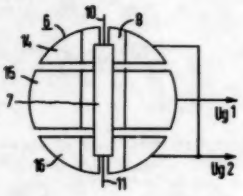
said predetermined frequency, said second transducer means being nodally mounted to said first transducer means.

4,373,144

CATHODE ARRANGEMENT FOR AN X-RAY TUBE

Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,216
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001141
Int. Cl.³ H01J *1/20, 35/00*
U.S. Cl. 313—338 2 Claims



1. A cathode arrangement for an x-ray tube comprising a cathode cup for electron focusing having a groove-like cavity and having a heater coil extending in a longitudinal direction in said cavity, said cathode cup (6) being subdivided approximately perpendicularly to the longitudinal direction of the heater coil (7) to define several parts (14, 15, 16) which are insulated from one another, and means for applying separate control potentials (Ug1, Ug2) to said parts (15; 14, 16).

4,373,145

THIN FILM ELECTROLUMINESCENT DEVICE

Shaun L. McCarthy, Ann Arbor, and John J. Lambe, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 49,855, Jun. 18, 1979, abandoned. This application Mar. 12, 1981, Ser. No. 242,966
Int. Cl.³ H01J *1/63, 1/70*
U.S. Cl. 313—503 3 Claims

1. An electroluminescent device which emits visible radiation in response to an applied voltage comprising:

a support substrate having a first surface;

a base conductor film of doped aluminum overlaying said substrate surface;

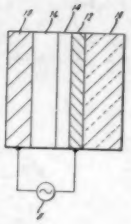
an electroluminescent barrier layer of impurity doped aluminum oxide overlaying said base conductor film;

a semi-transparent electrically resistive layer overlaying said barrier layer;

a relatively transparent counterelectrode overlaying said resistive layer, wherein said device emits visible radiation when said voltage is applied between said base conductor and said counterelectrode, and further wherein said barrier layer of aluminum oxide contains ions of said impurity;

said device being formed by a method including the following steps:

depositing aluminum alloyed, to a minor extent, with an impurity selected from the group consisting of manganese, praseodymium, neodymium, europium, terbium, dysprosium, holmium and erbium to form said base conductor film;



oxidizing said conductor film to form a nonporous layer doped with said impurity and defining said barrier layer;

depositing a layer of electrically resistive material selected from the group consisting of manganese oxide, molybdenum oxide, cerium fluoride, tungsten oxide, and magnesium fluoride on said nonporous barrier layer;

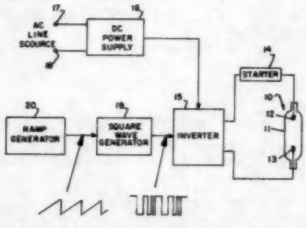
and depositing a semi-transparent metal film on said resistive layer to define said counterelectrode.

4,373,146

METHOD AND CIRCUIT FOR OPERATING DISCHARGE LAMP

Robert P. Bonazoli, Hamilton, and Fredrick W. Paget, Rockport, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 20, 1980, Ser. No. 198,321
Int. Cl.³ H05B *41/24*
U.S. Cl. 315—209 R 15 Claims

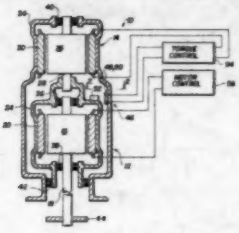


1. A method of operating a high intensity discharge lamp having a pair of electrodes hermetically sealed within an arc tube, the method comprises frequency modulating a carrier waveform in the Kilohertz range to provide an AC output having a continuously varying frequency, and applying said AC output across the electrodes of said lamp to thereby operate said lamp in a manner which minimizes or avoids acoustic resonance effects within said arc tube.

4,373,147
TORQUE COMPENSATED ELECTRIC MOTOR

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Stamford, Conn.

Filed Jul. 23, 1981, Ser. No. 286,297
Int. Cl.³ H02P 5/52
U.S. Cl. 318—48 14 Claims

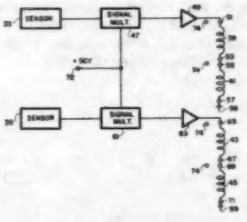


1. A torque compensated electric motor comprising:
a housing;
an output shaft extending from said housing;
a first rotor mounted to said output shaft in said housing;
a first stator rotatably mounted in said housing concentric to said first rotor;
a second rotor mounted in said housing to said first stator for rotation therewith;
a second stator mounted in said housing concentric to said second rotor;
means for measuring the reaction torque experienced by said first stator; and
control means for providing a control signal to said second stator as a function of said measured torque to produce a counter-torque in said second rotor to balance the reaction torque experienced by said first stator.

4,373,148
ROTATING ELECTRIC MACHINE HAVING A TOROIDAL WOUND MOTOR WINDING

Kenneth H. Gutz, Clearwater, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 235,287
Int. Cl.³ H02P 7/06
U.S. Cl. 318—254 10 Claims

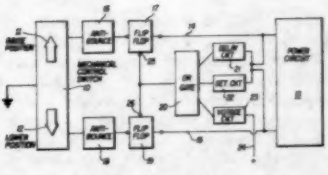


1. A rotating electric machine comprising, in combination:
a metallic housing having a pair of apertures;
a toroidal winding assembly coaxially mounted within said housing, said toroidal winding assembly having a cylindrical shaped ring, and first, second, third, and fourth coils, each coil of which is wound in a toroidal helix configuration around said cylindrical shaped ring, and each coil of which has first and second terminals with the second terminal of said first coil connected to the first terminal of said third coil, and the second terminal of said second coil connected to the first terminal of said fourth coil;
a rotor coaxially rotatable within said toroidal winding assembly and having on the periphery thereof a magnetic assembly, said magnetic assembly having alternately a plurality of north pole magnets and a plurality of south pole magnets generating a magnetic field having a predetermined magnetic flux density, said rotor having a nonmagnetized gap between each alternate north pole and south pole magnet and defining a gap between said rotor and said toroidal winding assembly;
first detecting means, mounted upon said housing and having an output, for sensing the flux density of the magnetic field generated by said magnetic assembly and for providing a first analog signal proportional to the flux density of the magnetic field sensed thereby;
second detecting means having an output, mounted upon said housing, and positioned upon said housing such that when said first detecting means is positioned adjacent one of said nonmagnetic gaps, said second detecting means will be positioned at the center of the adjacent north or south pole of said magnetic assembly, said second detecting means for sensing the flux density of the magnetic field generated by said magnetic assembly, and for providing a second analog signal proportional to the flux density of the magnetic field sensed thereby; and
circuit means having a first terminal connected to the output of said first detecting means, a second terminal connected to the output of said second detecting means, a third terminal connected to the first terminal of said first coil, a fourth terminal connected to the first terminal of said second coil, and a ground terminal connected to the second terminal of said third coil and the second terminal of said fourth coil providing a first winding excitation signal in response to said first analog signal, and a second winding excitation signal in response to said second analog signal, said first winding excitation signal to effect the excitation of the first and third coils of said toroidal winding assembly, and said second winding excitation signal to effect the excitation of the second and fourth coils of said toroidal winding assembly so as to cause the rotation of said rotor in a predetermined direction at a constant speed.

4,373,149
PULSE-CONTROLLED ELECTRIC WINDOW RAISER

Jean-Claude Coste, Marly-le-Roi, France, assignor to Regie National des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 9, 1980, Ser. No. 185,555
Claims priority, application France, Sep. 13, 1979, 79 22863
Int. Cl.³ H02P 1/18, 3/08
U.S. Cl. 318—281 5 Claims



1. An electric pulse-controlled unit for controlling movement of an automotive window provided for use in a vehicle having at least one lockable door with at least one window, comprising:
a motor for raising and lowering said at least one window;
power circuit means for activating said motor; including motor control means for providing one of a cut-off position and first and second active positions with said motor being activated for respectively raising and lowering said

window when one of said first and second active positions is provided;

a mechanical control switch enabling selection of one of the first and second active positions in order to operate the motor in a selected direction;

raising and lowering flip-flops having priority reset, preselection input and set-to-one inputs and being connected between the output of said mechanical control switch and the input of said power circuit means;

a control pulse resetting system coupled to the priority reset input of said flip-flops, comprising,

a first delay circuit controlled by the reverse outputs of said flip-flops;

a double control detection circuit controlled by the non-reverse outputs of said flip-flops;

a voltage loading detection circuit, and

an OR-gate having inputs coupled to outputs of said delay circuit, said double control detection circuit and said voltage loading detection circuit, as well as an output coupled to the priority reset inputs of said flip-flops;

wherein said mechanical control switch produces a pulse output upon a first selection of one of said first and second active positions to initiate respective raising or lowering of said window.

4,373,150

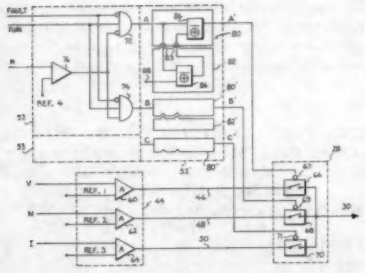
MOTOR CONTROL SYSTEM

Allen M. Ritter, Rocky Mount, Va., assignor to General Electric Company, Salem, Va.

Continuation of Ser. No. 104,018, Dec. 17, 1979, abandoned. This application Oct. 8, 1981, Ser. No. 309,731

Int. Cl.³ H02P 5/16

U.S. Cl. 318—336 **14 Claims**



1. A motor control system of the type in which a plurality of feedback control loops, respectively representing different individual types of motor operating parameters, are sequentially utilized to control motor operation in accordance with desired types of motor operation comprising:

(a) sequencing means responsive to external inputs denoting the desired types of motor operation for sequentially selecting which of said plurality of said feedback control loops is operative in accordance with a predetermined logic sequence pattern; and,

(b) modifying means selectively connectable to said sequencing means for modifying said predetermined logic sequence pattern to a modified logic sequence pattern whereby in the effective absence of said modifying means said sequencing means operates in said predetermined logic sequence pattern and in the effective presence of said modifying means said sequencing means operates in said modified logic sequence pattern.

4,373,151

STOCHASTIC DEMODULATOR FOR PHASE JUMP-MODULATED SIGNALS, OPERATING IN TIME DIVIDED UP OVER SEVERAL CHANNELS

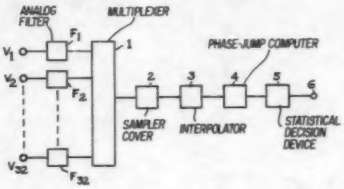
Jean-Pierre Houdard; Jean-Jacques Julie, and Bernard G. Leoni, all of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France

Filed Apr. 8, 1980, Ser. No. 138,285

Claims priority, application France, Apr. 11, 1979, 79 09147

Int. Cl.³ H04L 27/22

U.S. Cl. 329—104 **10 Claims**



1. A demodulation process for phase jump-modulated signals, in particular for the processing in time divided up over a plurality of transmission channels, comprising the steps of:

sampling and coding said signals on reception;

interpolating said sampled and coded signals in such a way as to obtain a whole number n of samples for each information symbol;

comparing with a fixed reference signal the phase deviation of each sample obtained after interpolation is calculated, wherein the thus calculated phase deviation of each sample is compared with the phase deviation calculated in the same way for the sample preceding the sample under consideration by n units;

code converting the result of the said comparison by comparing with a phase jump value having different comparison results, but which are in a same range of values;

starting a counter when the results of said comparison cross a threshold with said threshold corresponding to a given number of samples taken from a series of successive samples and all belonging to the same range of values; and

validating the result of said comparison when said counter reaches a given state to thereby output a demodulated signal.

4,373,152

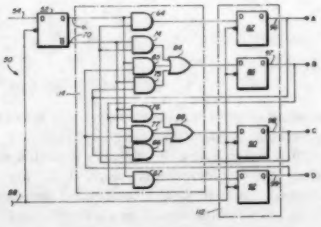
BINARY TO ONE OUT OF FOUR CONVERTER

Herbert K. Jacobsthal, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 22, 1980, Ser. No. 219,407

Int. Cl.³ H03K 13/24

U.S. Cl. 340—347 DD **7 Claims**



1. An apparatus for encoding a binary information stream having a first and second binary level arranged in a predeter-

mined order, a first binary bit within said binary information stream having said first level and a second bit of information within said binary information stream having said second binary level, comprising:

a logic input network connected to receive said binary information stream and to identify a current binary bit level;

a logic output network coupled to said input network to actuate one of four output terminals in response thereto as determined by said predetermined level order, said four output terminals being arranged in a series as a first, second, third and fourth output terminals said output logic network actuating said first and fourth output terminals after said third and second output terminals respectively, are actuated if said first binary bit is received by said input logic network, said output logic network actuating said second and third output terminals after said fourth and first output terminals respectively, are actuated and if said first binary bit is received by said input logic network, said output logic network actuating said second output terminal after said first and third outputs are actuated if said second binary bit is received by said input logic network, and said output logic network actuating said third output terminal after said second and fourth output terminals are actuated if said second binary bit is received by said input logic network.

4,373,153

STOP INDICATOR ARRANGEMENT FOR AN AUTOMOTIVE VEHICLE

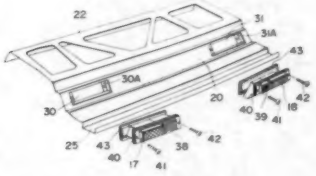
Isao Sano, Tokyo, and Hiroshi Kanamori, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 22, 1981, Ser. No. 275,823

Claims priority, application Japan, Aug. 12, 1980, 55-111385

Int. Cl.³ B60Q *1/00*; B62D *25/00*

U.S. Cl. 340—87 **10 Claims**



1. A stop indicator arrangement for an automotive vehicle having a rear window, a boot lid lower than the rear window in the closed position, and a brake system, the arrangement comprising:

(a) a laterally extending panel provided between the lower end of the rear window and the front end of the boot lid, the panel having an aperture therein and sloping downwardly in the direction from the front to the rear with respect to the vehicle;

(b) means for emitting light when energized;

(c) means for energizing the light-emitting means when the brake system is applied;

(d) a casing housing the light-emitting means and extending through said panel aperture;

(e) means for attaching the light-emitting means to the casing;

(f) a ventilating grille unit being contiguously combined with the casing and extending through the aperture of the panel;

(g) a flange formed around the combination of the casing and the grille unit; and

(h) means for attaching the flange to the panel to mount the combination of the casing and the grille unit.

4,373,154

DATA ENCODING AND/OR DECODING

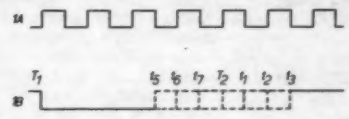
Michael J. Balme, Southampton, and David T. Edwards, Lymington, both of England, assignors to Racal Recorders Ltd., Bracknell, England

Filed May 15, 1981, Ser. No. 263,904

Claims priority, application United Kingdom, May 16, 1980, 8016313; Dec. 4, 1980, 8038980

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **27 Claims**



1. A system for encoding the value of units of data, comprising

means connected to receive each data unit and producing an electrical signal in response thereto, each electrical signal being of opposite polarity to the preceding one and being defined by oppositely directed signal transitions,

means connected to receive and sense the value of each data unit in turn and operative to control the time spacing between the transition to a respective electrical signal and the immediately preceding transition in dependence on the value of the data unit, one of the possible values of the data unit corresponding to a predetermined datum time spacing and the or each other possible value of the data unit having a respective pair of possible time spacings, one greater than, and one less than, the length of the datum time spacing, and

selecting means connected to receive and sense the values of the data units and operative in response to a data unit having the or each said other possible value to compare the two possible corresponding time spacings with signals representing the cumulative effect of the transitions on the mean long term time spacing and on the mean long term DC content of the output waveform produced by the electrical signals, so as to select that one of the two possible time spacings which constrains those mean values within predetermined limits.

4,373,155

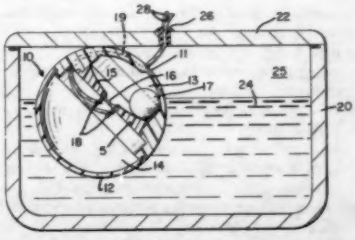
BRAKE FLUID LEVEL INDICATOR

Frank P. Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 12, 1981, Ser. No. 320,646

Int. Cl.³ G08B *21/00*; H01H *3/16*

U.S. Cl. 340—623 **5 Claims**



1. A fluid level indicator of the type comprising a fluid reservoir having a reservoir cover thereon and a float contained in said reservoir, said float being lighter than an equal

volume of the fluid whose level is to be indicated, said indicator being characterized in that

said indicator further has means for suspending said float from the reservoir cover, said suspending means limiting the downward travel of said float when the fluid level drops, said suspending means defining the apex of the float at the point of attachment thereto, said float being top-heavy toward said apex whereby said apex tends to submerge when the float is floating,

said float has an upper chamber and a lower chamber therein, said chambers being separated by an intermediate piece having a concave surface facing said upper chamber, said concave surface having a pair of metal contacts embedded in the center thereof flushly with said surface, said surface having a depression therein between said contacts, said contacts communicating with said lower chamber and having wires attached thereat, said wires being connected to warning means remote from said reservoir,

said upper chamber having a metal ball therein, whereby,

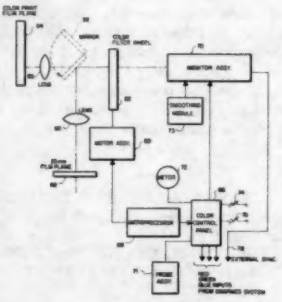
said float hangs upright on said suspending means and said metal ball rests in said depression and bridges said contacts when said fluid level is low, thereby activating said remote warning means, and said float tends to roll over so that said ball rolls out of said depression when said fluid level is high.

4,373,156

APPARATUS AND METHOD FOR PRODUCING RAPID, HIGH RESOLUTION HARD COLOR COPIES FROM COMPUTER-BASED GRAPHICS AND DIGITAL IMAGE PROCESSING SYSTEMS

Robert B. Pfaankuch, Northfield, Ill., and Fred W. Grab, Mission Viejo, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 11, 1980, Ser. No. 139,941
Int. Cl.³ G09G *1/28*
U.S. Cl. 340—703 **16 Claims**



1. A versatile, rapid and high resolution hard copy system for producing color copies from computer-based graphics and image processing, said system comprising:

(1) a computer-controlled color video signal graphics system comprising

(a) a CPU and a program memory electronically coupled to said CPU;

(b) a character generator means for producing electronically generated digital character and/or graphics data in response to commands from said CPU;

(c) input/output means for entering program and control data to said CPU; and

(d) a color video signal generating means for transforming said digital data from said character generator means into a plurality of separate color video signals; and

(2) a color camera system comprising

(a) a video imaging device for transforming said separate color video signals into video images;

(b) a system controller;

(c) a color control means electronically interconnected between said video imaging device and said system controller, said color control means being coupled to said separate color video signals output from said color video signal generating means, and said color control means being controlled by the system controller such that said plurality of separate color video signals are sequentially switched through to said video imaging device;

(d) a color film medium optically exposed in a synchronous manner to the sequence of video images being generated on said video imaging device; and

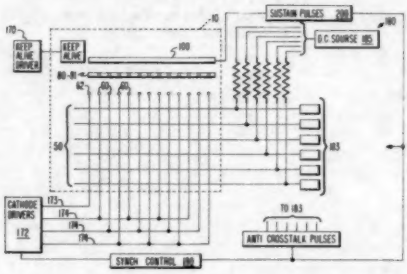
(e) color separation means placed in the optical path between said color film medium and said video imaging device, said color separation means being electronically connected to said system controller and controlled thereby so as to permit separate synchronous exposure of said color film medium to each video image corresponding to a separate color signal switched through to said video imaging device.

4,373,157

SYSTEM FOR OPERATING A DISPLAY PANEL

George E. Holz, North Plainfield, and Okan K. Tezucar, Scotch Plains, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 29, 1981, Ser. No. 258,875
Int. Cl.³ H01J *17/48*; G02F *1/01*
U.S. Cl. 340—805 **8 Claims**



1. A display panel and operating system therefor comprising

a gas-filled display panel including a matrix of D.C. scanning cells arrayed in columns and having scan electrode means for turning on all of the cells of each column sequentially and for selectively turning off one or more scan cells in each column as the column is turned on; and a matrix of display cells adjacent to said matrix of scanning cells, with each scanning cell communicating with a display cell through a small aperture in an electrode plate, and having display electrode means for operation to sustain display glow after glow has been transferred thereto from a scanning cell,

a source of sustaining signals coupled to said display electrode means,

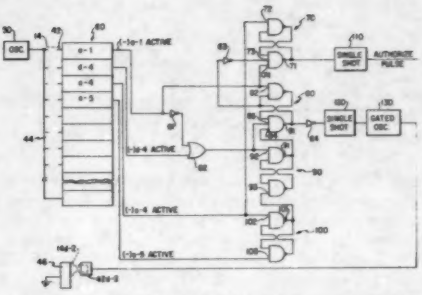
a source of display signals coupled to said scanning electrode means and operable to turn off selected scanning cells in each column of scanning cells as each such column is energized whereby glow is transferred from said selected scanning cells to the associated display cells, and

a source of anti-crosstalk pulses coupled to said scan electrode means for application thereto at the same time that display signals are coupled thereto.

4,373,158
DEVICE FOR ALTERING ENCODED DATA

Leslie M. Orloff, 6 Roughriders Ct., Huntington, N.Y. 11743

Filed Jul. 30, 1980, Ser. No. 173,821
Int. Cl.³ H04Q 9/00; G06K 7/06, 19/06
U.S. Cl. 340—825.3 4 Claims



1. Apparatus for altering and reading a record card of the type having a surface containing a plurality of electrically conductive bits arranged thereon in a predetermined pattern, at least one of said bits, at a predetermined location, being a debit bit adapted to be melted or burned away, said apparatus comprising:

a housing having a compartment adapted to accept the record card;

a source of an electrical debiting signal of predetermined power and duration;

means for detecting the insertion of said card into a predetermined position in said compartment;

means responsive to said detecting means for activating said debit signal source;

means for coupling said signal to at least one of said debit bits;

means for detecting whether the electrical continuity of said debit bit has been broken;

means responsive to said continuity detecting means for disabling said activating means;

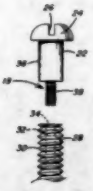
means responsive to said activating means and to said continuity detecting means for generating an authorize pulse; and

means independent of said activating means for reading said electrically conductive bits.

4,373,159
HEAT AND DETECTION RESISTANT IDENTIFICATION APPARATUS

Alvan W. Leavitt, West Mifflin, and Alice E. Primm, Pleasant Hills, both of Pa., assignors to Claim Guard Associates, Pittsburgh, Pa.

Filed Jun. 30, 1980, Ser. No. 164,360
Int. Cl.³ G01S 13/78; B65D 85/00
U.S. Cl. 343—6.5 R 39 Claims



1. Apparatus for identifying a structure comprising,

identification means containing preselected information associated with a structure for selectively identifying the structure,

a carrier member,

means associated with said carrier member for removably supporting said identification means on said carrier member,

said identification means includes an elongated metal strip having a preselected length and thickness,

said metal strip being flexible to facilitate insertion and confinement thereof within said carrier, and

said carrier member being adapted for releasable engagement with said structure to conceal said identification means from visual detection on the structure.

12. Apparatus for identifying a structure as set forth in claim 1 in which said identification means includes,

a radar transponder for transmitting a preselected signal from said carrier member,

said radar transponder being secured to said carrier member in a position to transmit a preselected signal from said carrier member for identifying the location of said carrier member,

said radar transponder having an antenna for receiving an incoming signal,

said carrier having an opening therein forming an internal recess for receiving said radar transponder,

said antenna projecting out of said recess to receive an incoming signal,

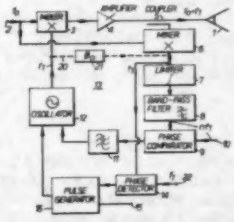
transmitter means associated with said radar transponder for generating a coded incoming signal to actuate said radar transponder, and

said radar transponder being operable upon actuation to transmit a preselected coded signal from said carrier back to said transmitter means to indicate the location of said carrier.

4,373,160
ANTENNA ARRANGEMENTS

David Cooper, Chelmsford, England, assignor to Marconi Company Limited, Chelmsford, England

Filed Aug. 8, 1980, Ser. No. 178,542
Claims priority, application United Kingdom, Aug. 10, 1979, 7928011
Int. Cl.³ H04B 7/00
U.S. Cl. 343—100 SA 8 Claims



1. An antenna arrangement having at least one antenna channel which comprises means for feeding a carrier signal via an amplifier to an antenna element, and a phase-locked loop which, in addition to said amplifier, includes: a controllable oscillator for generating an output signal having a predetermined intermediate frequency and a phase which is adjustable in dependence on a control signal; a mixer for mixing said output signal of said oscillator with a high frequency signal to form said carrier signal which is fed to said amplifier; a further mixer for mixing the output signal of said amplifier with said high frequency signal to reproduce said intermediate frequency; and phase comparison means for comparing the phase of the signal produced by said further mixer with a signal having a reference phase, with the result of said comparison being supplied to said oscillator as said control signal to control

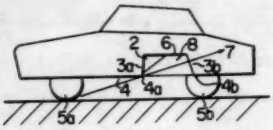
the phase of said intermediate frequency signal so that the phase of the carrier signal at the antenna bears a required relationship with said reference phase and is adjustable independently of variations in the frequency of said carrier signal.

4,373,161

DOPPLER RADAR MOUNTING STRUCTURE FOR MOTOR VEHICLES

Akira Matsumura, Yokosuka, Japan, assignor to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 179,982
Claims priority, application Japan, Aug. 25, 1979, 54-107695
Int. Cl.³ H01Q *1/32*
U.S. Cl. 343—717 **8 Claims**



1. A mounting structure of a Doppler radar speed sensor for an automobile, said Doppler radar speed sensor having an antenna section having an antenna mouth and a sensor section, being housed in a casing and attached to a bottom surface of a floor of said automobile for detecting the speed of said automobile, said mounting structure comprising:

a chamber formed in said floor forward of rear wheels of the automobile and rearward of front wheels of the automobile, which is recessed upward from the floor and open downward relative to a road surface for accommodating said casing of said sensor, and having a front side wall substantially perpendicular to a longitudinal axis of said automobile, a front edge defined as a line of intersection between a plane parallel to said floor and the lowermost end of said front side wall, and a top wall; and

means for mounting said casing of said Doppler radar speed sensor completely within a forward upper corner of said chamber defined by said top wall, said front side wall and a plane containing said front edge and a tangential line drawn from said front edge to an outer diameter of a wheel located ahead of said chamber, the mouth of said antenna being directed toward the road surface and the rear end of said automobile, and wherein said radar casing is in the form of a triangular prism,

whereby said Doppler radar speed sensor is protected from attacks by pebbles and splashes produced by said front wheels.

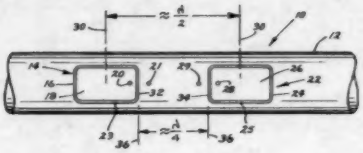
4,373,162

LOW FREQUENCY ELECTRONICALLY STEERABLE CYLINDRICAL SLOT ARRAY RADAR ANTENNA

Ralph W. Peterson, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Continuation of Ser. No. 129,146, Mar. 10, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,837
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—771 **2 Claims**

1. A radar antenna for frequencies in the 30 to 60 MHz range consisting of an array of "O" slot radar antennas wherein at least two "O" slot radar antennas, each antenna having a pair of parallel longitudinal portions and a pair of parallel transverse portions connected in the shape of a rectangle, are positioned on a conductive cylinder having a circumference not greater than 100 inches and each "O" slot antenna occupies less than one-third of the circumference of the cylinder and each of said antennas has a pair of connection points to a transmission line on one of said portions of said slot antenna transverse to the axis of the cylinder and wherein said connection point pairs for said slot antenna are in transverse portions approximately one-quarter wave length apart from one another and wherein each of said slot antennas has a total antenna length of approximately one wave length and wherein said slot antennas have the centers thereof approximately one-half wave length apart for the frequency of design and in which the continuous slot



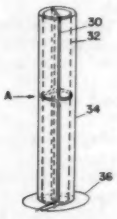
element defining the "O" shape of each antenna is a continuous physical and electrical interruption on the order of a very small fraction of a wave length in width and which forms a center conductive element which is the center of the "O" shape electrically isolated from said cylinder and to which one of said pair of connection points to a transmission line is fixed.

4,373,163

LOOP ANTENNA FOR SECURITY SYSTEMS

Jan Vandebult, Topsfield, Mass., assignor to I.D. Engineering, Inc., Ipswich, Mass.

Filed Jul. 14, 1980, Ser. No. 168,484
Int. Cl.³ H01Q *7/04*; G08B *13/24*
U.S. Cl. 343—842 **4 Claims**



1. A loop antenna for propogating or receiving electromagnetic radiation but not electrostatic radiation in conjunction with a security system for identifying the presence or absence of at least one resonant tag circuit in the presence of said antenna, said security system including at least one transmitter and at least one receiver, said antenna defined as a twisted loop antenna comprising:

a conductor formed in at least one twisted loop wherein a portion of a single loop is twisted at least 180° to form at least two adjacent, separate lobes of the same loop such that with a given current flow in said loop, said current circles in opposite directions in said adjacent lobes, said twisted loop having a perimeter and a common side between adjacent lobes;

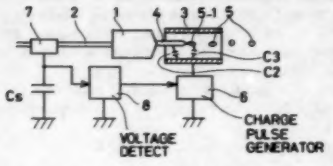
electrostatic shielding surrounding said perimeter of said twisted loop and surrounding said common side, a first insulative gap formed in said shielding surrounding said perimeter, and a second insulative gap formed in said shielding surrounding said common side, wherein said conductor and said shielding comprise a coaxial cable; and

further comprising a cylindrical form around which said coaxial cable is wrapped to form said twisted loop in the form of a figure "8" with a cross-over between adjacent loops traveling circumferentially around said cylindrical form to produce said common side, and said shielding of said cable at said cross-over being isolated against electrical contact to form said second gap.

4,373,164
DROPLET CHARGE CONDITION DETECTION IN AN INK JET SYSTEM PRINTER OF THE CHARGE AMPLITUDE CONTROLLING TYPE

Mikio Osaki, Koshihara, and Sumio Kita, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1981, Ser. No. 258,636
Claims priority, application Japan, Apr. 30, 1980, 55-59153
Int. Cl.³ G01D 18/00
U.S. Cl. 346—75 9 Claims



1. A charge condition detection system in an ink jet system printer of the charge amplitude controlling type which comprises an ink droplet issuance means for emitting ink droplets at a given frequency and charging tunnel means for charging said ink droplets in accordance with print information or by a phase detection search pulse, said charge condition detection system comprising:

detection electrode means disposed in an ink liquid supply system near said ink droplet issuance means and contacting an ink liquid to be supplied to said ink droplet issuance means;

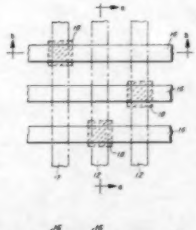
capacitor means connected to said detection electrode means for accumulating charges corresponding to charges carried by said ink droplets charged by said charging tunnel means; and

voltage detection means for detecting a voltage appearing across said capacitor means as a function of charges accumulated thereby.

4,373,165
VERY HIGH DENSITY PUNCH-THROUGH READ-ONLY-MEMORY

Al F. Tasch, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 92,241, Nov. 7, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 301,504
Int. Cl.³ H01L 29/90, 27/10; G11C 17/06, 11/36
U.S. Cl. 357—13 7 Claims



1. A semiconductor device comprising:

a body of monocrystalline semiconductor of one conductivity type having a plurality of parallel, elongated, surface regions of opposite conductivity type;

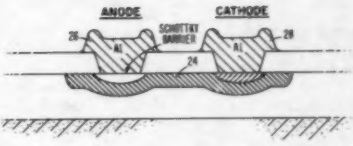
a plurality of elongated, subsurface parallel regions of opposite conductivity type, perpendicular to said surface plurality and spaced therefrom to form a criss-cross pattern; and

a subsurface plurality of regions of said one conductivity type located between selected crossing points of said pattern, said respective subsurface regions each being more heavily doped than said body of monocrystalline semiconductor.

4,373,166
SCHOTTKY BARRIER DIODE WITH CONTROLLED CHARACTERISTICS

D. L. Bergeron, Winooski; Daniel J. Fleming, South Burlington, both of Vt., and Geoffrey B. Stephens, Cary, N.C., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 971,166, Dec. 20, 1978, abandoned. This application Dec. 19, 1980, Ser. No. 218,156
Int. Cl.³ H01L 29/48, 29/64, 29/56
U.S. Cl. 357—15 7 Claims



7. A self-isolated Schottky Barrier Zener diode with controlled characteristics, comprising:

a semiconductor substrate of a first conductivity type and first concentration;

a Schottky Barrier contact formed in said first opening forming a rectifying junction with said semiconductor substrate in said central region;

a second opening through said insulating layer over said outside region of said sub-trate;

an ohmic contact formed in said second opening, making electrical contact with said ion-implanted layer in said outside region;

whereby a self-isolated Schottky Barrier Zener diode is formed with controlled characteristics and a lower series resistance connection is made to said Schottky Barrier Zener diode.

4,373,167
SOLID STATE IMAGE SENSOR WITH OVERFLOW PROTECTION AND HIGH RESOLUTION

Tetsuo Yamada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 2,001, Jan. 9, 1979, abandoned. This application Oct. 9, 1980, Ser. No. 195,614
Claims priority, application Japan, Jan. 13, 1978, 53-1971
Int. Cl.³ H01L 29/78, 27/14, 31/00
U.S. Cl. 357—24 3 Claims

1. A solid state image sensor comprising:

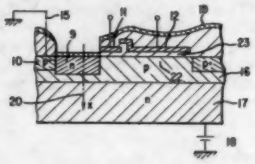
(a) a first conductivity type semiconductor substrate having first and second main surfaces;

(b) a second conductivity type semiconductor layer on the first main surface of the semiconductor substrate, which forms a first P-N junction therebetween wherein the first conductivity type semiconductor substrate and the second conductivity type semiconductor layer each extend over an area including at least the entire area of said image sensor;

(c) a first conductivity type region within the second con-

ductivity type semiconductor layer, which forms a second P-N junction therebetween and serves as a photoelectric conversion element formed of a photodiode in conjunction with the second conductivity type semiconductor layer;

(d) means for reading out signal carriers generated in the photoelectric conversion element including a gate electrode, a transfer electrode and a channel region, said channel region being formed within the second conductivity type semiconductor layer and beneath the gate electrode, wherein signal carriers are transferred from said photoelectric conversion element of the first conductivity region into the channel region under control of said gate electrode and said transfer electrode;



(e) biasing means for supplying a reverse bias voltage to the first P-N junction, which causes the second conductivity type semiconductor layer to be kept in the punch-through condition, said biasing means being connected to the second main surface of the semiconductor substrate;

(f) wherein the first conductivity type region is surrounded by a channel stop region;

said substrate having a first drain region beneath the photoelectric conversion element for preventing a blooming phenomenon and the excess signal carriers generated at the second P-N junction flowing into the substrate, and a second drain region beneath the means for reading out signal carriers for trapping unwanted carriers generated at the substrate due to long wave length light.

4,373,168

DIGITAL TIME-BASE CORRECTOR HAVING A WIDE CORRECTION RANGE

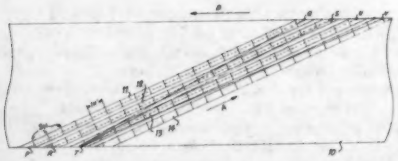
Mineo Mizukami, and Tatsuo Konishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 135,084

Claims priority, application Japan, Mar. 30, 1979, 54-39133; Mar. 30, 1979, 54-39135; Mar. 30, 1979, 54-39136

Int. Cl.³ H04N 9/46, 5/76

U.S. Cl. 358—19 **9 Claims**



1. A time-base corrector for correcting the time-base error contained in a television video signal comprising:

(a) means for generating a first clock pulse in synchronism with said television video signal;

(b) means responsive to said first clock pulse for converting said television video signal to a digital video signal;

(c) digital memory means for storing said digital video signal;

(d) means responsive to said first clock pulse, a first horizontal sync signal and a first vertical sync signal contained in said television video signal for generating write-in address data designating an address at which said digital video signal is to be written into said digital memory;

(e) means for generating a second clock pulse in synchronism with a reference signal;

(f) means responsive to a second horizontal sync signal and a second vertical sync signal contained in said reference signal and said second clock pulse for generating read-out address data designating an address at which the stored digital video signal is read out from said digital memory; and

(g) means responsive to said second clock pulse for converting the read-out digital video signal to an analog signal; wherein said first clock pulse generating means comprises:

(i) delay means for delaying the leading edge of said first horizontal sync signal to generate a delayed leading edge signal;

(ii) means for generating a first gate pulse of a predetermined pulse width in response to said delayed leading edge signal;

(iii) means for gating said first horizontal sync signal with said first gate pulse to extract a trailing edge signal from said first horizontal sync signal;

(iv) means for controlling the delay time of said delay means in response to the time interval between said delayed leading edge signal and said trailing edge signal;

(v) means for generating a second gate pulse in response to said trailing edge signal; and

(vi) means for gating said television video signal with said second gate pulse to extract a color burst signal; said first color pulse being produced from said color burst signal.

4,373,169

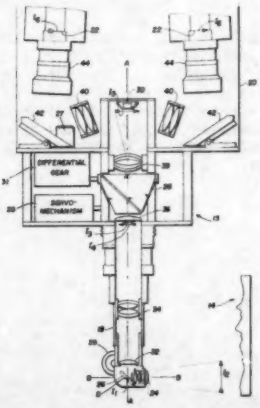
MULTI-WINDOW VISUAL DISPLAY SYSTEM FOR FLIGHT SIMULATORS

John E. Burkam, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 30, 1979, Ser. No. 89,694

Int. Cl.³ H04N 7/18

U.S. Cl. 358—104 **19 Claims**



1. In a vehicle movement simulator which includes a vehicle operator station having vehicle controls, a visual display apparatus for generating a plurality of images to provide an operator with a view of an environment through which his simulated vehicle appears to be moving, said visual display apparatus comprising:

a plurality of television monitors at said station for presenting said plurality of images;

a terrain model;

a probe, carrying a like plurality of television cameras, connected respectively to said television monitors, said probe and said terrain model being movable in translation relative to one another, said probe also carrying optical means for viewing and supplying said images of said terrain model to said television cameras;

computer means, connected to said vehicle controls, for generating position signals proportional to the location of the simulated vehicle relative to the environment through which it appears to be moving, said computer means also generating pitch, roll, and yaw signals proportional to the rotation of the simulated vehicle about pitch, roll, and yaw axes of the vehicle, respectively; and

positioning means, connected to receive said position signals generated by said computer means, for moving said probe relative to said terrain model;

said optical means including

a tube, having a first end and a second end defining an axis of said tube;

a single wide-angle objective lens means, which is pivotally connected to the second end of said tube and which includes an optical axis intersecting said tube axis, for transmitting a wide-angle image of said terrain model toward said tube axis;

a mirror means pivotally connected to the second end of said tube, for reflecting said wide-angle image along said tube axis toward the first end of said tube;

reflecting means, arranged around said tube axis at the first end of said tube, for reflecting a different portion of said wide-angle image to each television camera;

mirror rotating means, actuated by said wide-angle objective lens means, for rotating said mirror means as said wide-angle objective lens means is rotated so as to reflect the center of the wide-angle image along said tube axis:

yaw means, connected to receive said yaw signal generated by said computer means, for rotating said images of said terrain model about said yaw axis;

roll means, connected to receive said roll signal generated by said computer means, for rotating said images of said terrain model about said roll axis; and

pitch means connected to receive said pitch signal generated by said computer means, for rotating said wide-angle objective lens means proportional to the pitch signal, to thus rotate the images of said terrain model about said pitch axis.

4,373,170

PLAYBACK MODE SWITCHING CIRCUIT FOR TAPE RECORDER

Yoshimitsu Sunaga, and Satoru Honda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 16, 1980, Ser. No. 169,254

Claims priority, application Japan, Jul. 16, 1979, 54-90047; Jul. 16, 1979, 54-90048

Int. Cl.³ G11B *17/00, 15/48, 15/18*

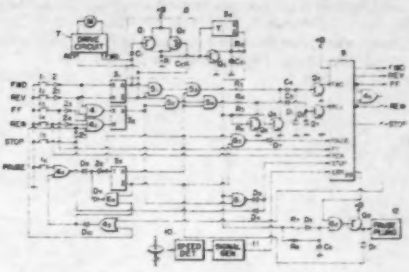
U.S. Cl. 360—71 **6 Claims**

1. A playback mode switching circuit for a tape recorder, comprising:

a first flip-flop circuit coupled to be set by operation of a forward switch and reset by operation of a reverse switch, to provide two outputs for selectively determining a direction of rotation of a capstan;

gate means receiving said two outputs to provide a forward operation signal and a reverse operation signal; and

a second flip-flop circuit coupled to be set by operation of either one of said forward switch and said reverse switch and coupled to be reset by a fast forward switch, a rewind switch or a stop switch,



said gate means being opened when said second flip-flop circuit is set and closed when said fast-forward switch, said rewind switch or said stop switch is operated.

4,373,171

METHOD FOR DECREASING THE STOP DISTANCE IN MOVING TAPE DEVICES

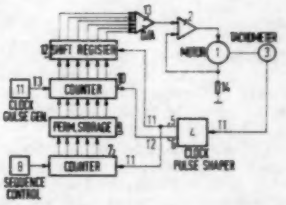
Robert Dengler, Taerkenfeld, and Franz J. Meyer, Emmering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 72,979, Sep. 6, 1979. This application Aug. 14, 1980, Ser. No. 177,968

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841106

Int. Cl.³ G11B *15/18, 15/48*

U.S. Cl. 360—71 **6 Claims**



1. A method for shortening the stop distance of a magnetic recording tape normally moving at a nominal velocity in a tape recording and reading device in which an amplifier-controlled motor is drivingly connected to a capstan for moving said tape, and in which a tachometer is connected to said motor and provides a digital pulse sequence which is proportional to the velocity of said motor, and in which newly written information is subjected to a read-after-write check, said method comprising the steps of

weakly retarding movement of said tape by slowly decelerating said motor during the duration of said read-after-write check until the velocity of said tape is 0.7 times said nominal velocity;

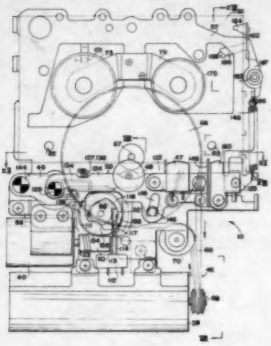
rapidly retarding movement of said tape immediately after said read-after-write check by rapidly decelerating said motor; and

continuing said rapid deceleration until said tape is stopped.

4,373,172
TAPE RECORDER

Kazuyasu Motoyama, and Toshihiro Nakao, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1980, Ser. No. 156,816
Claims priority, application Japan, Jun. 13, 1979, 54-74490
Int. Cl.³ G11B *21/12, 15/04, 5/54, 15/26*
U.S. Cl. 360—105 12 Claims



1. A tape recorder having a magnetic tape transport including a tape driving motor, the tape recorder further comprising:

a control motor disposed separately of the tape driving motor and controlled by the control switch;

a cam shaft to which the driving force of the control motor is transmitted;

a control switch having a movable element;

head support means for supporting a magnetic head and a pinch roller, said head support means being movable between a first position in which the magnetic head is in contact with a magnetic tape loaded in the tape recorder and the tape is clamped between the pinch roller and the capstan shaft and a second position in which the magnetic head is not in contact with the tape and the tape is not clamped between the pinch roller and the capstan shaft;

biasing means coupled to the head support means for biasing the head support means toward said first position thereof;

a press cam which is fixedly secured to the cam shaft and toward which the head support means is biased by the biasing force of the biasing means, the press cam being arranged to move the head support means against the force of said biasing means;

a control cam fixedly secured to the cam shaft and arranged to move the movable element of the control switch;

said movable element of the control switch being arranged to press against the control cam such that rotation of the cam shaft simultaneously rotates the press cam and control cam to thereby respectively move the movable element to change over the control switch and move the head support means against the biasing force of the biasing means by the unitary rotation of the control cam and press cam with the cam shaft.

4,373,173
MULTI-ELEMENT HEAD ASSEMBLY

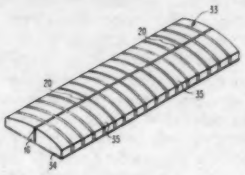
Neil L. Robinson, and Ralph D. Silkensen, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,562
Int. Cl.³ G11B *5/20, 5/22, 5/42*
U.S. Cl. 360—121 6 Claims

1. A multi-element magnetic head assembly comprising:

joined ferrite sandwich assemblies defining a multiplicity of separate transducing elements of uniform size and spacing, said sandwich assemblies comprising projections and cooperating slots for forming an interlocked head assembly;

thin film means forming multi-turn conductive coils for



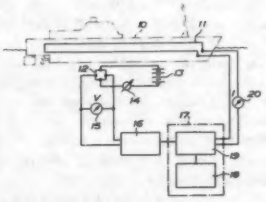
coupling respectively to said separate transducing elements, said thin film means being disposed on a bottom surface of said head assembly; and

an insulator material disposed over said conductive coils.

4,373,174
METHOD FOR PROTECTIVE MAGNETIZATION OF VESSELS

Nils B. Akesson, Nytorpsgatan 7, S-216 11 Malmö, Sweden

PCT No. PCT/SE79/00069, § 371 Date Nov. 25, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02017, PCT Pub. Date Oct. 2, 1980
PCT Filed Mar. 28, 1979, Ser. No. 227,881
Int. Cl.³ B63G *9/06*
U.S. Cl. 361—149 6 Claims



1. A method for the protective magnetization of a vessel having a magnetic loop comprising:

detecting the actual field strength of the magnetic field surrounding the vessel, as a function of the heading and longitudinal and transverse inclinations of the vessel, with a Hall generator, and

controlling the current through said magnetic loop so that the absolute value of the magnitude of the current increases faster than does the output of the Hall generator, to a maximum value.

4,373,175
APPARATUS TO DISSIPATE STATIC ELECTRICITY

C. Fred Mykkanen, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 17, 1981, Ser. No. 244,617
Int. Cl.³ H05F *3/02;* A61N *1/14*
U.S. Cl. 361—220 18 Claims

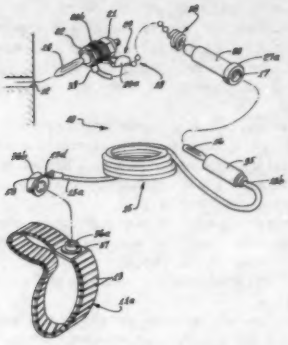
1. In safety apparatus connectible between a human and an electrically conductive terminal, the combination comprising

(a) an electrical part connectible to said terminal,

(b) a first electrical cable having one end adapted for electrical connection to said human,

(c) means interconnecting the opposite end of the cable and said part, said means including releasably interconnected plug and socket elements and an elongated flexible connection located between said elements and said part, said

elements being releasable in response to tension exertion transmitted between said cable and said flexible connection,



(d) and a second electrical cable coiled about said flexible connection and connected between one of said elements and said part to transmit electrical current therebetween, and to be free of tension when the flexible connection is tensioned.

4,373,176

ELECTROLYTIC CAPACITOR FOR AT LEAST 200 V SERVICE

Manuel Finkelstein, North Adams; Sidney D. Ross, and Franz S. Dunkl, both of Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 30, 1981, Ser. No. 306,992
Int. Cl.³ H01G 9/02
U.S. Cl. 361—433 **8 Claims**

1. An aluminum electrolytic capacitor comprising two contiguously wound aluminum foil electrodes with interleaved spacers, one of said foils bearing a barrier layer dielectric oxide on its surface, and an electrolyte in contact therewith, said electrolyte comprising as solute a tertiary amine or dipropylamine mono salt of dodecanedioic acid dissolved in a solvent mixture consisting of ethylene glycol, N-methyl-2-pyrrolidinone, and water and exhibiting a resistivity at 25° C. lower than said electrolyte absent either ethylene glycol or N-methyl-2-pyrolidinone and providing a capacitor that operates at 130° C. and at least 200 V.

4,373,177

HIGH TEMPERATURE ELECTROLYTIC CAPACITOR

Manuel Finkelstein, North Adams; Franz S. Dunkl, and Sidney D. Ross, both of Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 30, 1981, Ser. No. 306,994
Int. Cl.³ H01G 9/02
U.S. Cl. 361—433 A **4 Claims**

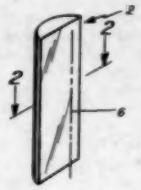
1. A high-temperature aluminum electrolytic capacitor comprising two aluminum electrode foils, with one of said foils bearing a barrier layer dielectric oxide, interleaved spacers wound throughout the length of said foils in contact with an electrolyte consisting essentially of ethylene glycol as solvent, water, a phosphate ion source, and as solute mono(di-n-propylammonium) adipate or mono(diisopropylammonium) adipate, thereby providing a capacitor capable of operating at 200 VDC or higher and at 130° C., said electrolyte having a room-temperature resistivity of at least 700 Ω-cm.

4,373,178

METHODS AND APPARATUS FOR CONTROLLING REFLECTED LIGHT

John E. Gulliksen, Shrewsbury, Mass., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Filed Nov. 3, 1980, Ser. No. 203,273
Int. Cl.³ F21V 7/00
U.S. Cl. 362—280 **19 Claims**



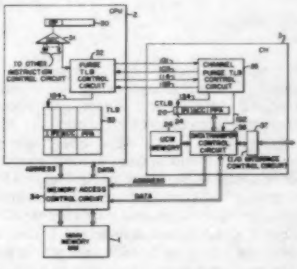
1. A method of producing a predetermined flood distribution of light from a luminaire body, said luminaire body including a paraboloidal reflecting surface and an actual light source located at the focal point of the reflecting surface, in which the actual light source is converted by clear refraction into a multiplicity of apparent light sources lying in a predetermined locus of such apparent light sources, the light radiating from the said apparent light sources impinging upon the reflecting surface at angles of incidence such that reflection from the reflecting surface provides a diverging light beam of predetermined character.

4,373,179

DYNAMIC ADDRESS TRANSLATION SYSTEM

Yutaka Katsumata, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 26, 1978, Ser. No. 919,173
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **4 Claims**



1. A data processing system comprising:
a main memory for storing an address translation table;
a central processing unit operatively connected to said main memory;
a plurality of channels or sub-system adapters operatively connected to said main memory and said central processing unit, each of said plurality of channels or sub-system adapters including main memory accessing means for accessing said main memory and for providing a physical page address to the respective channel or sub-system adapter by utilizing said main memory and said central processing unit to translate a logical page address to the physical page address, each said main memory accessing means comprising:
a register having areas for storing a copy of at least one entry

within said address translation table in said main memory and a validity bit indicative of the validity of said copy, said copy including the physical page address;

storage register means for storing the logical page address and an address in the page, said storage register means including a counter for indicating respective addresses in the page corresponding to said at least one entry within said address translation table by incrementing said address in the page;

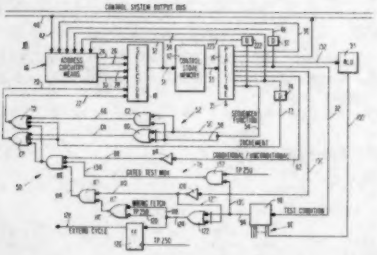
first means, operatively connected to said register and said counter, for accessing said main memory in accordance with a physical address comprising said copy, including the physical page address, and one of said respective addresses in the page; and

second means, operatively connected to said central processing unit, for altering the state of said storage area containing said validity bit when said central processing unit has issued an instruction for updating said at least one entry within said address translation table or an instruction indicating alteration of said at least one entry, so that said validity bit is indicative of an invalid entry copy.

4,373,180
MICROPROGRAMMED CONTROL SYSTEM CAPABLE OF PIPELINING EVEN WHEN EXECUTING A CONDITIONAL BRANCH INSTRUCTION

James P. Linde, Lafayette Hill, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 9, 1980, Ser. No. 167,072
Int. Cl.³ G06F 9/28, 9/38
U.S. Cl. 364—200 **2 Claims**



1. A microprogrammed control system which is capable of simultaneously fetching and executing microinstructions during a cycle time of the control system, comprising:

a control store memory (COS) which stores at least one microprogram having at least one conditional address microinstruction and at least second and third microinstructions, said at least one conditional address microinstruction having a programmable test condition field and a programmable anticipated condition field;

a pipeline register means connected to said control store memory for receiving a microinstruction therefrom and formed to store a microinstruction to be executed;

address circuitry means connected to said pipeline register and said COS for forming an ordinary address of a microinstruction in said microprogram which is one greater than the address of said microinstruction stored in said pipeline register means, and for forming at least one conditional address of a microinstruction in said microprogram which is different from said ordinary address;

test circuitry means connected to said pipeline register means for testing one of a plurality of conditions present in said microprogram control system when said at least one conditional address microinstruction is stored in said pipeline register means, said test circuitry means operating in response to bit signals transmitted from said programmable test condition field;

selection circuitry means connected to said pipeline register means, said address circuitry means and said control store memory for selecting one of said addresses from said address circuitry means and for transmitting said address to said control store memory before said test circuitry means has completed said testing, whereby the result of testing by said test circuitry means is anticipated, said selection circuitry means operating in response to at least one bit signal transmitted from said programmable anticipated condition field when said at least one conditional address microinstruction is present in said pipeline register means;

said selection circuitry means further comprises correction circuitry connected to said test circuitry means for changing said selection of said address when the actual result of said testing by said test circuitry means is different from said anticipated result;

said conditional address microinstruction comprises a sequencer function field wherein said address circuitry means forms a plurality of conditional addresses of a plurality of microinstructions stored in said microprogram;

a selector in said selection circuitry connected to said address circuitry means and said control store memory, said selector responsive to selector control signals to transmit said selected one of said addresses to said control store memory;

gating circuitry connected to said selector;

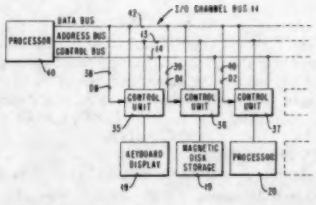
sequencer circuitry connected between said pipeline register means and said gating circuitry for generating selector control signals to select said conditional address from said address circuitry means in response to bit signals transmitted from said sequencer function field; and

anticipated condition circuitry connected between said pipeline register means and said gating circuitry for gating said selector control signals from said sequencer circuitry through said gating circuitry to said selector when said anticipated result calls for said conditional address, and for transmitting selector control signals to said selector to select and transmit said ordinary address in said address circuitry means to said control store memory when said anticipated result calls for an ordinary address.

4,373,181
DYNAMIC DEVICE ADDRESS ASSIGNMENT MECHANISM FOR A DATA PROCESSING SYSTEM

Douglas R. Chisholm, 1531 Ilene Ct., Delray Beach, Fla. 33444, and Hobart L. Kurtz, Jr., 425 N.W. 11th St., Boca Raton, Fla. 33432

Filed Jul. 30, 1980, Ser. No. 173,586
Int. Cl.³ G06F 9/30
U.S. Cl. 364—200 **6 Claims**



6. In a data processing system having a processor, a processor I/O bus, a plurality of peripheral devices and a plurality of control units for coupling the peripheral devices to the processor I/O bus, wherein each peripheral device is identified by means of a different device address assigned thereto, a dynamic device address assignment apparatus comprising:

a first device address register located in a first control unit

for holding the device address assigned to its peripheral device;

a second device address register located in a second control unit for holding the device address assigned to its peripheral device;

circuitry responsive to the appearance of a unique I/O command on the I/O bus and to the activation of a first unique set of the data lines of the I/O bus by the processor for loading into the first device address register a first address supplied to the I/O bus by the processor for enabling such address to become the assigned device address;

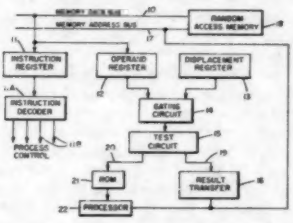
and circuitry responsive to the appearance of the unique I/O command on the I/O bus and to the activation of a second and different unique set of the data lines of the I/O bus by the processor for loading into the second device address register a second address supplied to the I/O bus by the processor for enabling such address to become the assigned device address.

4,373,182

INDIRECT ADDRESS COMPUTATION CIRCUIT

Gary E. Schultz, San Juan Capistrano, Calif., and Albert J. Weidner, Tempe, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 19, 1980, Ser. No. 179,514
Int. Cl.³ G06F 9/36
U.S. Cl. 364—200 **15 Claims**



1. A data processing system comprising:

first address means for storing a first address signal component;

second address means for storing a second address signal component;

calculation means having a first input connected to said first address means and a second input connected to said second address means,

said calculation means operative to produce output signals based upon the value of the data supplied to said first and second inputs;

test means connected to receive said output signals from said calculation means, said test means operative to generate first and second enabling signals dependent upon the status of said output signals;

transfer means connected to receive a first output signal from said calculation means and responsive to said first enabling signal from said test means for transferring said first output signal through said transfer means directly; and

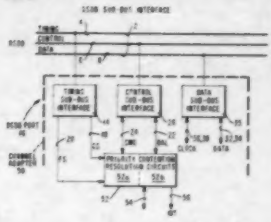
processing means connected to receive a second output signal from said calculation means and responsive to said second enabling signal for further processing the data on said first and said second inputs of said calculation means, and producing a further output signal as the result of the further processing.

4,373,183

BUS INTERFACE UNITS SHARING A COMMON BUS USING DISTRIBUTED CONTROL FOR ALLOCATION OF THE BUS

Rodney J. Means, Tucson, Ariz.; Galen P. Plunkett, Jr., Burke; Charles A. Dennis, Warrenton, both of Va., and John L. Moon, Washington, D.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 20, 1980, Ser. No. 179,904
Int. Cl.³ G06F 3/04; H04Q 9/00
U.S. Cl. 364—200 **18 Claims**



1. In a distributed data processing system including a plurality of bus interface units interconnected by a clock line which defines a periodic message frame, a serial bus allocation line and a data bus, an apparatus for the distributed allocation of the data bus to pending messages to be transmitted thereover in a time division multiple access mode, comprising:

a priority contention resolution circuit in a first bus interface unit having a talk address, including a transmission means having an output connected to said allocation line, said transmission means having an output for sequentially transmitting during a first message frame, a priority value and said talk address thereover in the form of a multibit binary number with the high order bit of said priority value first, in a synchronous manner with transmissions of respective priority values and talk addresses by other bus interface units contending for use of said data bus;

a monitoring means in said circuit having an input connected to said allocation line, for cyclically monitoring each sequential binary bit state of said allocation line and comparing it with a corresponding bit value of said priority value and talk address of said first bus interface unit;

an inhibiting means in said circuit having an input connected to said monitoring means and an output connected to said transmission means, for inhibiting the transmission of a corresponding bit of said priority value and talk address, if its value is less than the value of said binary bit state of said allocation line;

said circuit transmitting an allocation message including a listen address during said first message frame over said allocation line to a second bus interface unit connected thereto having said listen address when said priority value and talk address is greater than said respective priority values and talk addresses of said other interface bus units, said allocation message identifying a data message to be sent by said first bus interface unit over said data bus to said second bus interface unit in the next message frame.

4,373,184

VERTICAL FLIGHT PATH STEERING SYSTEM FOR AIRCRAFT

Antonius A. Lambregts, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1979, Ser. No. 107,464
Int. Cl.³ G06F 15/50; G06G 7/78; G05D 1/08
U.S. Cl. 364—434 **10 Claims**

1. An aircraft control and display system providing computer augmented manual steering capability comprising:

control reference means for receiving and processing a

signal representative of the pilot's steering input to develop a control reference signal which is proportional to the time integral of said pilot's steering input;

aircraft sensing means for sensing and supplying a signal representative of the controlled state of the aircraft;

control command means for processing said control reference signal and said signal representative of the controlled state of the aircraft to produce a control surface command that automatically controls the craft's dynamics to smoothly bring the controlled state to track the control reference value; and

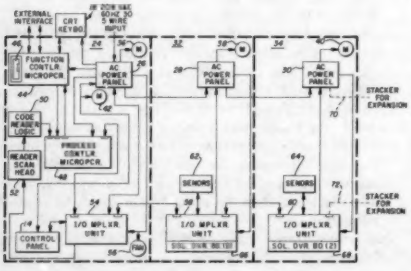
display means for displaying said control reference value and said controlled state of said craft to the pilot.

4,373,185

TRACKING IN A DISTRIBUTION SYSTEM

David A. Mills, Plano, and Norris G. Turner, Dallas, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Nov. 13, 1980, Ser. No. 206,670
Int. Cl.[3] B65H *43/00*
U.S. Cl. 364—478 17 Claims



1. A method of tracking an item identified by a location code to one of a plurality of diverter stations in a distribution system, comprising the steps of:

injecting items in sequence into the distribution system, each item identified by a location code,

generating an injection signal in response to each item injected into the distribution system indicating that a location code is to be tracked,

advancing the location code for each item through a series of storage locations representing an image of the distribution system to track the movement of each item, each storage location representing an increment of distance in the distribution system, one or more of the storage locations having an identifying code identifying one of the plurality of diverter stations, and

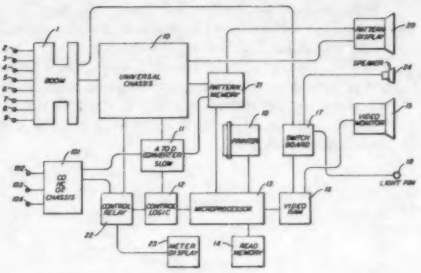
generating a tracking signal to a diverter station associated with a location code.

4,373,186

MATRIX METHOD AND APPARATUS FOR ENGINE ANALYSIS

John P. Marshall, Plainwell, and Denais A. Ruffer, Kalamazoo, both of Mich., assignors to Allen Group Inc., Kalamazoo, Mich.

Filed Aug. 14, 1980, Ser. No. 177,846
Int. Cl.[3] G06F *15/50*; G01M *15/00*
U.S. Cl. 364—551 8 Claims



1. In an apparatus for diagnosing at least one selected system of an internal combustion engine which includes means for receiving digital electrical measurement signals corresponding to measured values of a plurality of engine operating parameters associated with the engine system, means for storing digital electrical signals for the programmed diagnosis of the at least one selected system of the internal combustion engine and means for processing the digital electrical measurement signals in accordance with the programmed diagnosis, the improvement comprising:

the means for processing in cooperation with said means for storing making at least one yes/no comparison of a plurality of selected digital electrical measurement signals with respective predetermined values stored in the means for storing and providing the result of each such comparison as a digital result signal, selecting and evaluating digital result signals indicative of the yes/no comparison results in accordance with a predetermined AND diagnostic equation stored in the means for storing, and generating a signal related to the state of the at least one engine system being diagnosed based upon one or more AND correspondences only, of the digital result signals selected according to the predetermined diagnostic equation.

4,373,187

CORRECTIVE FEEDBACK TECHNIQUE FOR CONTROLLING AIR-FUEL RATIO FOR AN INTERNAL COMBUSTION ENGINE

Toshio Ishii; Yasunori Mouri; Osamu Abe, all of Katsuta, and Taiji Hasegawa, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,753
Claims priority, application Japan, Jul. 20, 1979, 54-91536
Int. Cl.[3] F02B *1/06*; F02M *7/16*
U.S. Cl. 364—431.06 26 Claims

1. In an engine fuel control method for an engine having a combustion chamber for the combustion of fuel supplied thereto; an output shaft rotated by mechanical energy converted from thermal energy generated in said combustion chamber; a first sensor for sensing an operating condition of the engine; a second sensor for sensing a condition of exhaust gas produced by the combustion of the fuel in said combustion chamber; arithmetic means for determining a control amount of fuel based on the outputs of said first and said sensors; a drive circuit for producing a control signal in response to the output of said arithmetic means; and fuel supply means for

supplying fuel in accordance with the output of said drive circuit;

said method comprising:

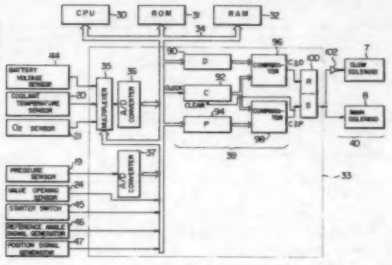
a first step for detecting the outputs of said first and second sensors;

a second step for determining a first value indicative of such amount of fuel supplied that assures a predetermined air to fuel ratio in said combustion chamber, based on the output of said first sensor;

a third step for correcting the amount of fuel supplied such that an air to fuel ratio close to said predetermined air to fuel ratio is established in said combustion chamber, based on the output of said second sensor; and

a fourth step for applying data representing the corrected amount of fuel from said arithmetic means to said drive circuit;

an improvement wherein said third step includes:



a fifth step for increasing or decreasing the data value indicative of the amount of fuel supplied before a change of the operation condition of the engine, based on the output of said second sensor;

a sixth step for determining the difference between the second value determined in said second step based on the output of said first sensor before said change of the operation condition of the engine and the first value determined in said second step based on the output of said first sensor after said change of the operating condition of the engine; and

a seventh step for increasing and decreasing the data value determined in said fifth step by the value determined in said sixth step;

the data value determined in said seventh step being applied to said drive circuit in said fourth step as a data value after said change of the operation condition of the engine.

4,373,188

CIGARETTE WEIGHT MONITORING SYSTEM

John G. Dowding; Peter R. Turner, both of London, and Robert J. Hudson, Pootings, Nr. Edenbridge, all of England, assignors to Molins Limited, London, England

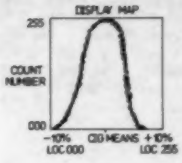
Filed Oct. 9, 1979, Ser. No. 82,902

Claims priority, application United Kingdom, Oct. 7, 1978, 39720/78

Int. Cl.³ G06G *7/48*; G01B *13/02*

U.S. Cl. 364—552 **8 Claims**

1. Apparatus for providing a graphic display of the distribution of weights of cigarettes produced by a continuous rod cigarette making machine, about a desired mean valve, comprising analog-to-digital converter means for converting a series of analog weight signals for successive cigarettes or cigarette lengths to digital signals; a memory including a plurality of storage locations; means for allocating a binary bit corresponding to each weight signal, to a memory location in accordance with the digitized value of said signal; means for periodically scanning the memory to determine the number of bits assigned to each location; and means for successively



supplying signals representing each location and the number of bits assigned to it, to a graphic display device.

4,373,189

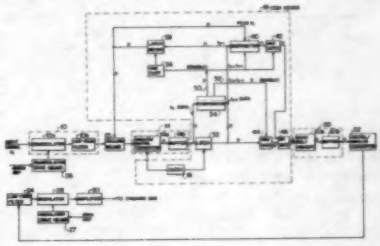
SIGNAL CONVERSION DEVICE

Charles M. Weant, 1806 Old Annapolis Blvd., Annapolis, Md. 21401

Filed Aug. 28, 1980, Ser. No. 182,290

Int. Cl.³ G06J *1/00*

U.S. Cl. 364—602 **4 Claims**



1. A signal conversion circuit for converting a periodic, analog, electrical input signal into an output signal differing from the input signal in amplitude and/or frequency and/or phase comprising:

scaling means for changing the amplitude of the input signal so that the peak thereof equals a preselected value;

A/D converter means operatively connected to said scaling means for sampling the amplitude of the input signal and changing the sampled values to an equivalent set of digital words, each digital word corresponding to the value of its associated sample;

a comparison, subtraction and scale adjustment (CSSA) means operatively connected to said A/D converter means and to said scaling means for receiving the output of said A/D converter means and storing it until the next output thereof is received, and for comparing each present output sample (t_n) of said A/D converter means with its prior output sample (t_{n-1}) once each cycle of the input signal V_i of said signal conversion circuit, the present and prior output samples being used to correct the scaling of said scaling means;

ROM means operatively connected to said CSSA means so as to receive the output of said A/D converter means, in the form of output digital words, for storing at each digital word address thereof another digital word in accordance with pre-programmed values corresponding to the values of a desired output signal; and

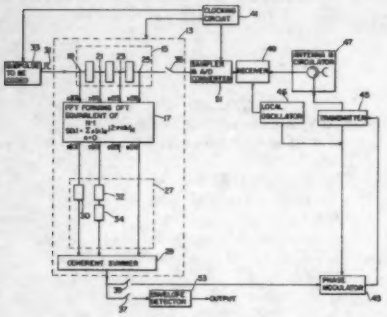
D/A converter means operatively connected to said ROM means for converting the output digital words thereof into corresponding analog values.

4,373,190

EFFICIENT, PRECOMPRESSION, BANDWIDTH-TOLERANT, DIGITAL PULSE EXPANDER-COMPRESSOR

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1981, Ser. No. 227,323
Int. Cl.³ G01S 13/28
U.S. Cl. 364—715 8 Claims



1. An efficient, pre-compression, bandwidth-tolerant, digital pulse expander-compressor comprising:

transform means having N output terminals and responsive to an applied subpulse for successively generating N replicas x(n) of the subpulse, where n=0, 1, 2,–, N−1 and N is an integer, in a time which is N times the length of the subpulse, and for weighting the replicas x(n) in accordance with the formula

$$x(k) = \sum_{n=0}^{N-1} x(n)e^{-j2\pi nk/N}$$

where k=0, 1, 2,–, N−1, to provide N weighted subpulses s(k), each at a respective one of the N output terminals, whenever one of the N replicas x(n) is generated; and

delay-summation means connected to the transform means for delaying each of the N weighted supulses s(k) corresponding to any replica of the applied subpulse by a time which is

$$N\left(k+\frac{N}{2}-1\right)$$

the length of the applied subpulse for $0 \leqq k \leqq N/2-1$, and by a time which is

$$N\left(k-\frac{N}{2}-1\right)$$

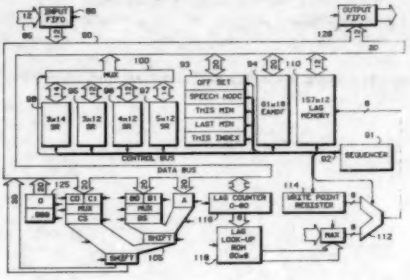
the length of the applied subpulse for $N/2+1 \leqq k \leqq N-1$, and for separately summing the real and imaginary parts of the delayed subpulses.

4,373,191

ABSOLUTE MAGNITUDE DIFFERENCE FUNCTION GENERATOR FOR AN LPC SYSTEM

Bruce A. Fette, Mesa; Bruce D. Harte, Scottsdale, and Bill E. Tennyson, Paradise Valley, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 10, 1980, Ser. No. 205,537
Int. Cl.³ G06F 15/31; G10L 1/00
U.S. Cl. 364—724 12 Claims



1. A high speed digital low pass filter comprising:

(a) a semiconductor chip;

(b) a data bus formed on said chip;

(c) a plurality of memory elements formed on said chip with each memory element of the plurality having a plurality of delay stages different than the plurality of delay stages for each of the other memory elements, and each of said plurality of memory elements having an input and an output operatively coupled to said bus;

(d) a plurality of storage devices formed on said chip and equal to the number of memory elements in said plurality of memory elements and each device being associated with a different one of said plurality of memory elements, each storage device having an input and an output operatively coupled to said bus;

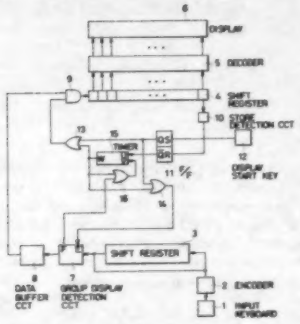
(e) an arithmetic logic unit formed on said chip and having first, second and third inputs operatively coupled to said data bus, said logic unit further having an output for supplying signals equal to A±B±C, where A is a signal applied to the first input, B is a signal applied to the second input, and C is a signal applied to the third input; and

(f) system control means formed at least partially on said chip for first connecting data words to be filtered to the first input of said logic unit and to the input of one of said plurality of memory elements by way of said data bus, connecting the output of the one of said plurality of memory elements to the second input of said logic unit by way of said data bus, and connecting the output of the associated one of said plurality of storage devices to the third input of said logic unit by way of said data bus, and second connecting the output of said logic unit to the input of the associated one of said plurality of storage devices, to the first input of said logic unit and to the input of a second one of said plurality of memory elements by way of said data bus, connecting the output of the second one of said plurality of memory elements to the second input of said logic unit by way of said data bus, and connecting the output of the storage device associated with the second memory element to the third input of said logic unit by way of said data bus, a low pass filtered data word being available at the output of the logic unit.

4,373,192
DISPLAY DEVICE OF AN ELECTRONIC LANGUAGE INTERPRETER

Shigenobu Yanagiuchi, Tenri, and Ikuo Kanou, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1980, Ser. No. 180,871
Claims priority, application Japan, Aug. 27, 1979, 54-109572; Aug. 29, 1979, 54-110800
Int. Cl.³ G06G *15/38*; G08B *5/22*
U.S. Cl. 364—900 **8 Claims**



1. An electronic dictionary and language interpreter device wherein a first word represented in a first language is entered to obtain a second word or words represented in a second language equivalent to the first word, comprising:

input means for entering the first word;

memory means for storing a plurality of words of the second language inclusive of the second word or words and at least a mark for separating said second words or groups of said second words;

access means responsive to entry of the first word by said input means for addressing said memory means for retrieving the second word or words;

display means comprising means for displaying a predetermined number of characters and responsive to said access means for displaying the second word or words;

means associated with said display means for shifting the second word or words displayed thereon when the data length of the second word or words exceeds said predetermined number of characters;

means for detecting that said mark is displayed in a selected portion within the display means; and

means responsive to said detecting means for replacing all characters indicated on said display with a new display of up to said predetermined number of characters.

4,373,193
LOGIC STATE ANALYZER

George A. Haag, Colorado Springs; O. Douglas Fogg, Loveland; Gordon A. Greenley; Steve A. Shepard, both of Colorado Springs, all of Colo., and F. Duncan Terry, Meridan, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 75,787, Sep. 17, 1979, abandoned, which is a continuation of Ser. No. 828,138, Aug. 29, 1977, abandoned. This application Nov. 25, 1980, Ser. No. 210,462
Int. Cl.³ G06F *3/05*, *3/153*
U.S. Cl. 364—900 **7 Claims**

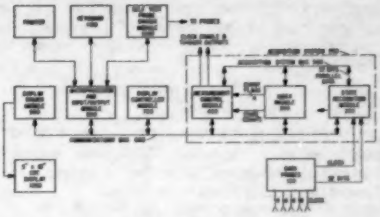
1. Apparatus for selecting, storing and displaying a qualified subset of the states occurring in a collection of digital signals, the apparatus comprising:

control means for designating from among the collection of digital signals a qualification state and a trigger state;

input means coupled to receive the collection of digital signals for performing signal conditioning thereon according to preselected thresholds to produce a collection of conditioned signals;

qualification state detection means coupled to the collection of conditioned signals and to the control means for producing a qualifier signal upon the occurrence of the designated qualification state in the collection of conditioned signals;

trigger state detection means coupled to the collection of conditioned signals and to the control means for producing a trigger signal upon the occurrence of the designated trigger state in the collection of conditioned signals;



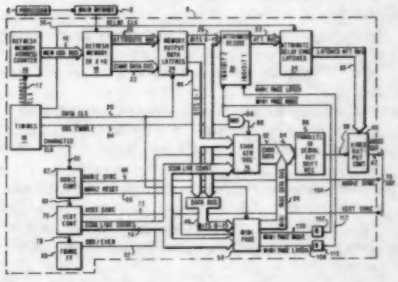
storage means coupled to the collection of conditioned signals, the qualifier signal and to the trigger signal for storing those states in the collection of conditioned signals producing the qualifier signal, until a preselected number of such storage operations occur subsequent to the occurrence of the trigger signal; and

display means coupled to the storage means for displaying the states stored therein.

4,373,194
FULL PAGE REPRESENTATION THROUGH DYNAMIC MODE SWITCHING

Kent R. Demke, Austin, and Jerold D. Dwire, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,671
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **10 Claims**



1. In a system including display screen means, memory means, printer means, and means for displaying a miniature representation of a full page of text being developed for output by said printer means,

the method of dynamically switching from displaying full size data representations to miniature data comprising the steps of:

(1) determining the width in spaces and the height in lines, of the miniature page;

(2) calculating the number of available spaces remaining after the miniature page width is determined;

(3) loading the portion of memory means associated with

said display means with full size character data for up to the number of spaces determined in the previous step, said full size character data being in the form of an attribute word and a character word;

(4) loading a predetermined attribute word, immediately after said full size character data, said predetermined attribute word being accessible by means for switching said display means into means for displaying a miniature page representation;

(5) loading in said memory means one more full size character word followed by miniature page data in all the memory locations for the remainder of the available spaces of said miniature page data being loaded in both attribute and character words.

4,373,195

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

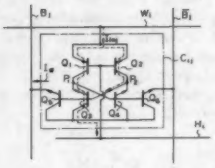
Kazuhiro Toyoda, Yokohama; Chikai Ono, Kawasaki, and Toshio Hayashi, Iruma, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 24, 1980, Ser. No. 200,217

Claims priority, application Japan, Oct. 30, 1979, 54-140087

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **11 Claims**



1. A semiconductor integrated circuit device comprising:

a plurality of word lines;

a plurality of word drivers, each said word driver being connected to one of said word lines;

a plurality of hold lines;

a plurality of pairs of bit lines;

a plurality of bit drivers, each said bit driver being connected to one of said pairs of bit lines;

a plurality of memory cells of integrated injection logic, each said memory cell being operatively connected to one of said plurality of word lines, to one of said plurality of hold lines and to one of said plurality of pairs of bit lines; and

a bit line clamp circuit operatively connected between said pairs of bit lines and a reference power supply, said clamp circuit comprising at least one dummy cell, any fluctuation of characteristics induced in each said dummy cell by manufacturing processes correspond to those of each said memory cell, so that a reference voltage of said reference power supply minus a voltage drop due to said bit line clamp circuit is applied to said plurality of pairs of bit lines.

4,373,196

DECODER CIRCUIT

Hideaki Isogai, Higashikurume, and Miki Tanaka, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 29, 1980, Ser. No. 220,970

Claims priority, application Japan, Dec. 27, 1979, 54-169186

Int. Cl.³ G11C *7/00*

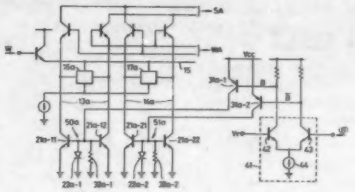
U.S. Cl. 365—189 **6 Claims**

1. A decoder circuit comprising:

a plurality of outputs select lines, each having active and non-active states;

a differential amplifier circuit for receiving at least one line selection signal to be decoded and for generating an output signal in response to said line selection signal;

switching circuits operatively connected to said differential amplifier circuit, for providing a switching signal to activate selected lines of said output select lines according to the output signal supplied from said differential amplifier circuit; and



constant current supplying circuits correspondingly connected to said switching circuits and to said output select lines, for supplying constant current to the selected output select lines according to the switching signal supplied from said switching circuits, said switching circuits being connected in parallel with respect to said constant current supplying circuits.

4,373,197

EXPLORATION SYSTEM FOR ENHANCING THE LIKELIHOOD OF PREDICTING LITHOLOGY OF EARTH FORMATIONS ASSOCIATED WITH DEPOSITS OF ORE, MARKER ROCK AND/OR ECONOMIC MINERALS

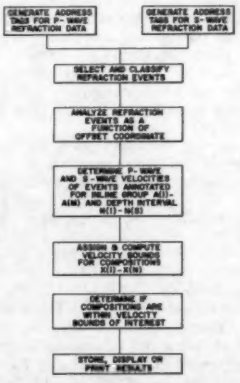
Gary S. Gassaway, San Rafael; William R. Scott, El Cerrito, and Richard J. Runge, Anaheim, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 971,627, Dec. 20, 1978, abandoned.

This application Aug. 8, 1980, Ser. No. 176,605

Int. Cl.³ G01V *1/30*

U.S. Cl. 367—36 **12 Claims**


GENERATE ADDRESS TAGS FOR P-WAVE REFRACTION DATA
GENERATE ADDRESS TAGS FOR S-WAVE REFRACTION DATA
SELECT AND CLASSIFY REFRACTION EVENTS
ANALYZE REFRACTION EVENTS AS A FUNCTION OF OFFSET COORDINATE
DETERMINE P- WAVE AND S - WAVE VELOCITIES OF EVENTS ANNOTATED FOR INLINE GROUP A(I)-A(N) AND DEPTH INTERVAL H(1) - H(8)
ASSIGN & COMPUTE VELOCITY BOUNDS FOR COMPOSITIONS X(1) - X(N)
DETERMINE IF COMPOSITIONS ARE WITHIN VELOCITY BOUNDS OF INTEREST
STORE, DISPLAY OR PRINT RESULTS

1. Method of accurately determining lithology of an earth formation to identify ore, marker rocks, economic minerals or the like, using a refraction exploration field system including a series of detectors, positioned along a line or survey at inline positions $X_1, X_2, \ldots X_n$ and at least one seismic source located adjacent to said detectors for producing a seismic wave for travel through said formation:

(a) generating a seismic wave at a first sourcepoint location adjacent said series of detectors;

(b) after said wave undergoes refraction, detecting arrival of a refracted wave at said series of detectors at said inline

offset positions, to obtain a first set of traces associated with said offset positions $X_1, X_2, \ldots X_n$;

(c) repeating steps (a) and (b) by generating a second wave at a second sourcepoint adjacent to inline position X_n of said detector positions, and detecting said refracted wave to obtain a second set of traces;

(d) advancing said series of detectors a selected number of inline positions or fractions thereof and repeating steps (a), (b) and (c) above to obtain additional sets of traces, but in which said additional sets of traces are associated with more than two inline positions overlapping common inline positions of said first and second sets of traces;

(e) distinguishing arrival times of shear waves from compressional waves so as to indicate true compressional and shear wave velocities associated with a series of depth intervals within said earth formation;

(f) after computing compressional and shear wave velocity values for a plurality of mineral compositions of variable size, comparing such computed values with said indicated true compressional and shear wave velocities of step (e) whereby the lithology of said earth formation can be accurately predicted.

4,373,198

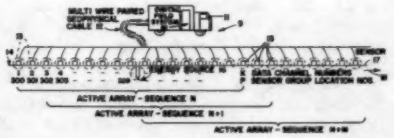
UPDATING AND ALERTING METHOD AND APPARATUS ASSOCIATED WITH A MICROCOMPUTER SYSTEM FOR AUTOMATICALLY INDICATING AND RECORDING PARAMETERS THAT SPATIALLY DEFINE LOCATIONS OF SEISMIC EXPLORATION SPREAD AND SOURCE ARRAYS

H. T. Carruth, Jr., Anaheim, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 16, 1980, Ser. No. 169,334

Int. Cl.³ G01V *1/20, 1/28;* G08C *25/00*

U.S. Cl. 367—37 **8 Claims**



1. Method of selectively providing an alarm-generating digital code so as to alert an operator that a next-in-time array positions of a source-detector array associated with a recording truck are the last approved array locations, using a microcomputer system that includes an MPU, memory means and a series of display, switching and alarm means interconnected via a system bus, comprising:

(a) storing as data bits, information as to the maximum number of detectors or detector groups accommodated by a fixed roll switch matrix size associated with said array;

(b) at the end of each seismic data collection cycle, determining a difference value between (a) and the total number of detectors or detector groups that will have been employed at the end of the next-in-time collection cycle, and using said difference value to conditionally generate said alarm-generating digital code so as to alert said operator when the next-in-time positions are the last approved array locations for said source-detector array.

4,373,199

APPARATUS FOR ELECTROMAGNETICALLY IMPARTING STYLUS FORCE FOR SOUND REPRODUCING DEVICE COMPRISING AN INHIBIT CIRCUIT FOR SHOCK NOISE OF REPRODUCING STYLUS

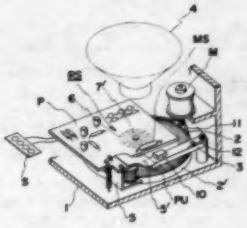
Katsumi Watanabe, Kawasaki, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 252,952

Claims priority, application Japan, Apr. 15, 1980, 55/49404; Jun. 17, 1980, 55/82003

Int. Cl.³ G11B *1/00, 25/04*

U.S. Cl. 369—31 **5 Claims**



1. An apparatus for electromagnetically imparting stylus force for a sound reproducing device having a recorded disc rotatably supported on a chassis, an electric motor for driving said disc, a tone arm biased both in the direction away from said disc and in the direction toward a starting position of reproduction, said apparatus comprising:

electromagnetic actuator means having an armature for urging said tone arm toward the recorded surface of said disc when said actuator is energized;

rotary switch means disposed between said chassis and said recorded disc and including a rotary contact and a plurality of fixed contacts, said rotary switch means being arranged such that said rotary contact rotates with the rotation of said recorded disc so as to be in contact sequencially with said fixed contacts, said fixed contacts and a position toward which a pickup of said tone arm is lowered being arranged in a predetermined positional relationship so that said pickup may engage the reproduction start point of a specified one of recorded grooves provided circumferentially on said recorded disc;

an electric power source;

a motor circuit connected across said power source and including a motor and a first transistor connected in series with said motor;

an actuator transistor circuit means connected in series with said electromagnetic actuator means, the series connection between said actuator transistor circuit means and said electromagnetic actuator means being connected across said power source; a series circuit consisting of start switching means, a normally open magnetic sensitive read switch and a capacitor, said series circuit being connected across said power source;

a base of said first transistor being connected to said power source through said start switching means;

a base of said actuator transistor circuit means being connected to said rotary contact of said rotary switch means;

a second transistor arranged for self holding, a base of said second transistor being connected to the connection between said electromagnetic actuator means and a collector of said actuator transistor circuit means, an emitter of said second transistor being connected to said series circuit, a collector of said second transistor being connected to the connection between said rotary contact and said actuator transistor circuit means;

magnet means provided on said tone arm; and

said reed switch being disposed at an end position of the sound reproduction of said recorded disc,

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4,373,200

TURNTABLE MOUNTINGS FOR RECORD PLAYERS

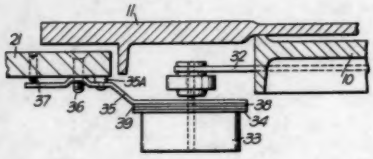
Peter B. Dunlop, Troon, Scotland, assignor to Aristoscot Designs Limited, Troon, Scotland

Filed Jan. 15, 1980, Ser. No. 112,295

Claims priority, application United Kingdom, Jan. 18, 1979, 7901804; Jun. 7, 1979, 7919861

Int. Cl.³ G11B *19/20*

U.S. Cl. 369—263 7 Claims



1. Phonographic apparatus comprising a carcass, a rotatable platter having a rotational axis, a motor drivingly coupled to the platter, a pickup arm assembly having a mounting point, and a platform mounting the platter, the platform being resiliently mounted in the carcass; in which said platform extends along a line between the rotational axis of the platter and the mounting point of the pickup assembly, and the pickup assembly is mounted on one end of said platform; where the motor is mounted to the carcass by adjustable mounting means which are adjustable to position the motor in both height and attitude with respect to the platter and where said mounting means comprises a bracket which carries said motor at one end and which is secured at its other end to the underface of a closure plate detachably secured to the top of the carcass, the bracket being secured to the closure plate by means of two bolts, said mounting means further including a set-screw positioned to one side of the bolts and passing through the closure plate into engagement with the bracket, and a resilient stud positioned to the other side of the bolts and located between the bracket and the closure plate, said bolts and set-screw being adjustable to set said motor at the correct height and attitude in relation to said platform.

4,373,201

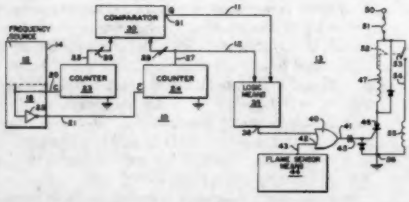
FAIL SAFE DIGITAL TIMER

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 28, 1980, Ser. No. 210,967

Int. Cl.³ G06F *11/16*

U.S. Cl. 371—68 10 Claims



1. A fail safe digital timer, including: clock means having output means providing clock pulses and complimentary clock pulses; first counter means connected to said clock output means to receive said clock pulses with said first counter means having output means to provide first counter codes; second counter means connected to said clock output means to receive said complimentary clock pulses with said second counter means having output means to provide second counter codes; comparator means connected to the output means of said counter means to compare said first and said second counter codes; said comparator means having a repetitive output signal upon both said counter means successfully counting the clock pulses and the complimentary clock pulses; said repetitive output signal ceasing upon the failure of the proper outputs being present from said clock means, said counter means, and said comparator means; and load means connected to said repetitive output signal and the counter codes from said second counting means; said load means being responsive to the presence or absence of said repetitive output signal from said comparator means along with the counter codes from said second counter means.

4,373,202

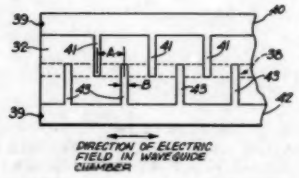
RF EXCITED WAVEGUIDE GAS LASER

Katherine D. Laakmann, and Peter Laakmann, both of Laguna Niguel, Calif., assignors to Walwel, Inc.

Filed Sep. 24, 1979, Ser. No. 78,343

Int. Cl.³ H01S *3/05*

U.S. Cl. 372—64 14 Claims



1. In an rf excited waveguide laser of the type having means defining an elongated chamber of a specified length and of cross-sectional dimensions suitable for guiding laser light and for generating therein a laser-exciting discharge and an active laser gas disposed in said chamber, said laser gas having a laser transition capable of providing stimulated emission of quanta of light energy at a desired wavelength, wherein the improvement comprises:

means for establishing an alternating electric field in said chamber along a direction parallel to the length thereof to establish the laser-exciting discharge in said laser gas, said means for establishing an alternating electric field including first and second pluralities of electrically conductive elements disposed interdigitally and transverse to the length of said chamber along at least a first elongated wall thereof.

4,373,203

CIRCUIT ARRANGEMENT AND METHOD FOR ASSESSING COMMUNICATION ACTIVITY ON A PARTICULAR RADIO COMMUNICATION CHANNEL

Stephen L. Rhodes, Reading, England, assignor to Racal Communications Equipment Limited, Bracknell, England

Filed Sep. 22, 1980, Ser. No. 189,146

Claims priority, application United Kingdom, Sep. 28, 1979, 7933705

Int. Cl.³ H04B *1/10*

U.S. Cl. 375—10 7 Claims

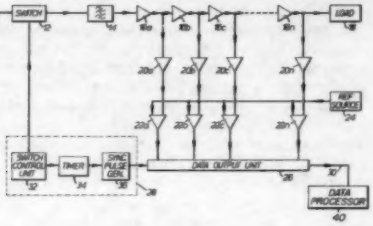
1. A circuit arrangement responsive to an alternating input signal for assessing the level of the signal within a predetermined passband, comprising

a passband filter tuned to the predetermined passband,

means for switching the input signal into the filter at a time t_1,

means for providing a time delay of a predetermined length beginning at t_1,

means for selectively sampling the level of the output signal of the filter, said sampling means being coupled to time delay means so as to be operative at at least one predetermined instant in time which is after the end of said time delay and which is selected such that the magnitude of the



envelope of the transient signals due to frequencies present in the output signal of the filter but outside the passband is temporarily at a minimum, and

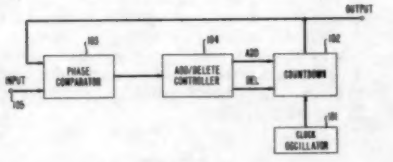
means for assessing the level of the output of the filter at the or each said time instant thereby to assess the level of the signal within the predetermined passband while avoiding interference from signals outside the passband.

4,373,204

PHASE LOCKED LOOP TIMING RECOVERY CIRCUIT

Grant P. Brooks, Randolph, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 2, 1981, Ser. No. 230,760
Int. Cl.³ H04L 7/08
U.S. Cl. 375—120 **4 Claims**



1. A timing wave recovery circuit comprising:

means for generating phase shiftable timing wave signals,

means for developing analog phase error signals whose amplitudes define magnitudes of phase differences between the timing wave signals and input signals,

timing means arranged to pass from an initial condition to an operated condition after an interval of time in response to a persistance of the phase error signals,

means responsive to the operated condition of the timing means for repeatedly shifting the phase of the timing wave signals, and

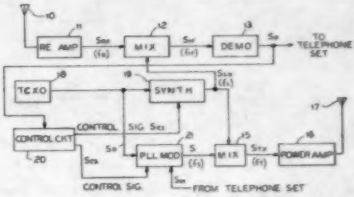
means responsive to discontinuance of the phase error signals for resetting the timing means without delay to the initial condition.

4,373,205

RADIO SUBSCRIBER SYSTEM WITH EFFICIENT USE OF RADIO FREQUENCY CARRIER WAVES

Yasuhiro Mizota, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,797
Claims priority, application Japan, Jun. 12, 1979, 54-74107
Int. Cl.³ H04B 1/40
U.S. Cl. 455—86 **2 Claims**



1. A channel-switching system comprising:

a plurality of channels, each of which transmits and receives over individually associated a transmission and reception carrier waves with a frequency interval between said transmission and reception carrier waves, at least one of said frequency intervals on one of said channels being different from the other frequency intervals on other of said channels;

means for receiving the plurality of reception carrier waves;

means for transmitting the plurality of transmission carrier waves;

first mixer means coupled to said receiving means for frequency-mixing the output of said receiving means with an oscillation signal;

means coupled to said first mixer means for demodulating the output of said first mixer means;

means for generating a reference frequency signal;

modulation means responsive to a first control signal for converting said reference frequency signal into one of a plurality of carrier waves respectively corresponding to said plurality of transmission carrier waves and for modulating the converted signal with a signal which is to be transmitted;

second mixer means coupled to said modulation means for frequency-mixing the output of said modulation means and said local oscillation signal and for supplying the frequency-mixed signal to said transmitting means as one of said plurality of transmission carrier waves;

frequency-synthesizing means responsive to a second control signal for frequency-synthesizing said reference frequency signal to provide said local oscillation signal and for supplying it to said first and second mixer means;

means responsive to the output of said demodulation means for detecting a signal designating a channel number; and

means responsive to the detected signal for supplying said first and second control signals to said modulation means and said frequency-synthesizer means, respectively.

4,373,206

TRANSMITTER CONTROL SYSTEM

Yoshiharu Suzuki, and Tomokazu Kai, both of Toyko, Japan, assignors to Nippon Electric Co., Inc., Tokyo, Japan

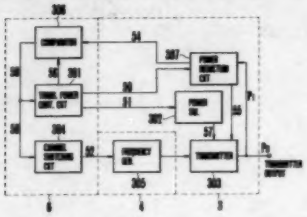
Filed Dec. 24, 1980, Ser. No. 220,132
Claims priority, application Japan, Dec. 28, 1979, 54-170433
Int. Cl.³ H04B 1/02, 3/60
U.S. Cl. 455—103 **5 Claims**

1. In a multi-channel mobile radio transmitter, a transmitter control system comprising:

transmitter means for transmitting one of multiple channel frequencies;

output power control means for controlling the transmitter means so as to reduce the transmitter output;

channel switching means for selecting one of the multiple channel frequencies to be transmitted from the transmitter means; and



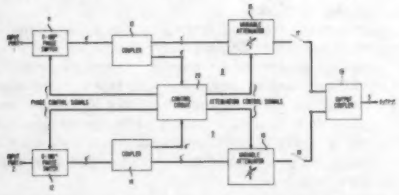
comparator means for comparing a transmitter activation signal with a signal from the transmitter output so that a comparison signal produced upon occurrence of failure of the transmitter means drives the channel switching means and the output power control means to select another channel and to reduce the transmitter output, respectively.

4,373,207

SPACE DIVERSITY SIGNAL COMBINER

Rudolf P. Hecken, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1980, Ser. No. 217,567
Int. Cl.³ H04B 7/08
U.S. Cl. 455—139 **3 Claims**



1. A signal combiner **10** for combining two signals ($A, Be^{j\phi}$) whose magnitudes (A, B), and relative phase (ϕ) are variable, comprising;

first and second signal path (**8, 9**);

control means (**13, 14, 20**) for sensing the magnitudes (A, B) and the relative phase (ϕ) between the signals in said paths and for generating attenuation control signals in response thereto;

attenuator means (**15, 16**) responsive to said attenuation control signals for causing the attenuation in the signal path handling the smaller of said two signals to vary as a function of said relative phase;

and means (**19**) for combining the signals in said signal paths (**8, 9**) in a common output (**3**).

4,373,208

CIRCUIT ARRANGEMENT FOR TUNING INTO ONE OF A NUMBER OF RADIOELECTRIC SIGNALS

Pietro Belisomi, Pinerolo, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Dec. 19, 1978, Ser. No. 971,073
Claims priority, application Italy, Dec. 30, 1977, 69950 A/77
Int. Cl.³ H03J 5/00
U.S. Cl. 455—186 **28 Claims**

1. A circuit arrangement for tuning to one of a number of radioelectric signals receivable on a signal receiver set comprising:

a controllable oscillator exhibiting a variable output frequency signal depending upon a binary number N;

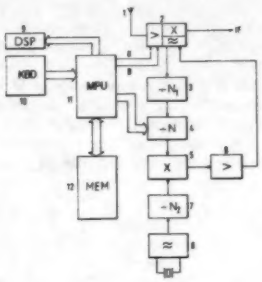
frequency divider means for receiving said output signal from said controllable oscillator and a sequence of coded signals representing said binary number N and producing a first output signal whose frequency depends upon said binary number N;

means for producing a reference signal having a predetermined frequency in the form of a second output signal;

comparator means for comparing said first and second output signals and producing a third signal for required tuning, said third signal being applied to said controllable oscillator for varying the output frequency thereof as a function of the binary number N;

memory means having a plurality of storage locations for storing data relative to signals tuned in digital form;

means for selectively generating coded input data; and



processor means responsive to said coded input data for supplying a sequence of coded signals representing said binary member N to said frequency divider means, said processor means being selectively responsive to said coded input data to sequentially scan said storage locations of said memory means in automatic or manual, step-by-step modes and to supply said sequence of coded signals representing said binary number N both in direct response to said coded input data and in response to data provided by said memory means, said processor means being set in response to coded input data taking the form of a first coded input signal to generate a particular sequence of N numbers corresponding to the total number of receivable radioelectric signals according to a pre-established transmission standard and responsive to coded input data taking the form of a second coded input signal to advance the number N within said particular sequence by one increment.

4,373,209

METHOD AND CIRCUITRY FOR CONTROLLING THE INTERMEDIATE FREQUENCY OF AN FM RECEIVER TO LESSEN PHASE DISTORTION

Ryoichi Kaneda, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

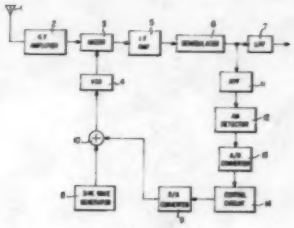
Filed Feb. 17, 1981, Ser. No. 234,960
Claims priority, application Japan, Mar. 10, 1980, 55-29878
Int. Cl.³ H04B 1/26
U.S. Cl. 455—208 **8 Claims**

1. Circuitry for controlling the intermediate frequency signal occurring at an intermediate frequency amplification stage of an FM receiver having FM signals applied thereto comprising modulating means for frequency modulating the intermediate frequency signal with a modulating signal of predetermined frequency where said modulating means includes a voltage controlled oscillator, the output of which is mixed

with the FM signals applied to the receiver and a sine wave generator, the output of which FM modulates the voltage controlled oscillator;

detecting means for detecting the absolute amount of distortion incurred by said modulating signal of predetermined frequency at the intermediate frequency amplification stage of the FM receiver; and

control means for changing the intermediate frequency by incremental amounts to control the intermediate frequency so that the distortion at the intermediate frequency amplification stage is minimized in accordance with any increase or decrease in the distortion detected by said detecting means where said control means includes means



for generating a DC signal which is added to the output of the sine wave generator where the DC signal determines the central frequency of the voltage controlled oscillator; means for establishing an initial value of said DC voltage and the value of an incremental voltage; means for successively adding or subtracting said incremental voltage from the initial DC voltage to obtain an incremented DC voltage; comparison means for comparing the incremented DC voltage before and after each increment thereof; and means responsive to the comparison means for continuing the incrementing of the DC voltage until the distortion at the intermediate frequency amplification stage is minimized.

4,373,210

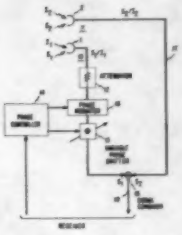
SPACE DIVERSITY COMBINER

Peter D. Karaklnis, Atkinson, N.H., and Hotze Miedema, Boxford, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1981, Ser. No. 248,356

Int. Cl.³ H04B 1/06

U.S. Cl. 455—273 **2 Claims**



1. A space diversity combiner comprising:

first and second antenna circuits (10, 11);

means (15) for combining the signals (S_1 and S_2) in said circuits in a common output circuit (19);

and attenuating means (12) disposed in the antenna circuit (10) having the smaller signal-to-interference ratio (S_1/I_1);

said attenuator being adjusted to reduce the contribution of the signal (S_1) in the antenna circuit (10) having the smaller signal-to-interference ratio such that the attenuated signal power S_1' at the input of said combining means (15) is given by

$$S_1'/S_2=(S_1/I_1)/S_2/I_2$$

where

S_1/I_1 and S_2/I_2 are the signal-to-interference power ratios for the two antennas; and

$$S_1/I_1<S_2/I_2.$$

DESIGNS

FEBRUARY 8, 1983

267,830

DRESS FOR THE INFIRM

Arnette R. Arnseth, Four Maida Ct., Red Bank, N.J. 07701, and Theresa A. Celendano, Four Knollwood Rd., Holmdel, N.J. 07733

Filed Feb. 19, 1980, Ser. No. 122,749

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—82

267,832

DISPOSABLE BOOT

James B. Pask, 2812 Bree Hill Rd., Oakton, Va. 22124

Filed Nov. 8, 1979, Ser. No. 92,278

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—271

267,831

HEAD CAP FOR HOLDING ELECTRICAL PROBES AND MEDICAL DISPENSERS

Edward Sucato, 3015 E. Thomas Rd., Ste. 18, Phoenix, Ariz. 85016

Filed May 8, 1980, Ser. No. 148,031

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—230

267,833

COMBINED CLASP AND TOGGLE FOR NECKTIE OR THE LIKE

Arne E. E. Anderson, 3101 NW. 75th St., Seattle, Wash. 98117

Filed Sep. 15, 1980, Ser. No. 187,179

Term of patent 14 years

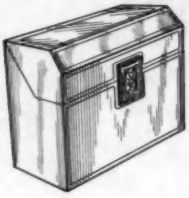
Int. Cl. D2—*07*

U.S. Cl. D2—407

267,834
DOCTOR'S ATTACHE CASE
Siang Y. Tow, 30 Dickens St., Penang, Malaysia
Filed Sep. 19, 1980, Ser. No. 188,693
Claims priority, application United Kingdom, Mar. 20, 1980, 994146
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—74

267,835
LUGGAGE
Ted Stark, Montclair, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,402
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

267,836
BOX FOR FILE CARDS
Henri Benichou, Paris, France, assignor to Galerie Shirvane, Paris, France
Filed Aug. 28, 1980, Ser. No. 182,318
Claims priority, application France, Mar. 4, 1980, 80 0668
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—78



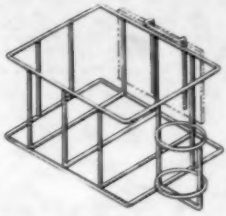
267,837
HELIODON
Joseph C. Migani, 8200 Knollwood Cir., Charlotte, N.C. 28213, and Charles C. Benton, Atlanta, Ga., assignors to Joseph C. Migani, Charlotte, N.C.
Filed Jun. 13, 1980, Ser. No. 159,068
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—27

267,838
CHAIR
Randall P. Buhk, Wyoming; Kenneth W. Hozeski, Grandville, and Alex Karrip, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Nov. 5, 1979, Ser. No. 91,694
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

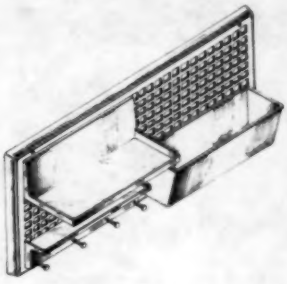
267,839
BED HEADBOARD OR SIMILAR ARTICLE
Sidney A. Lenger, Jr., Jamestown, N.C., assignor to The Singer Company, Stamford, Conn.
Filed Sep. 12, 1980, Ser. No. 186,775
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80

267,840
TOWEL RACK
Piet Coben, Amsterdam, Netherlands, assignor to Materias Plasticas, Limitada, Leiria, Portugal
Filed Nov. 4, 1980, Ser. No. 204,031
Claims priority, application Portugal, May 9, 1980, 15.094
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99

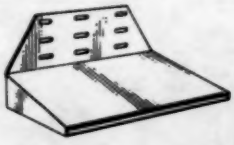
267,841
COMBINED SUPPORT FOR BEVERAGE COOLER AND DRINKING GLASSES
Dennis R. Leslie, 9722 Rose Dr., Taylor, Mich. 48180
Filed Aug. 6, 1980, Ser. No. 175,609
Term of patent 14 years
Int. Cl. D6—*04*; D12—*16*
U.S. Cl. D6—130



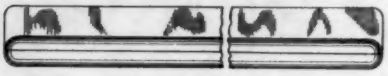
267,842
STORAGE UNIT
Anthony J. Brescia, Liverpool, and Spencer Rhoads, Baldwinsville, both of N.Y., assignors to Syroco, Inc., Syracuse, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,852
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131



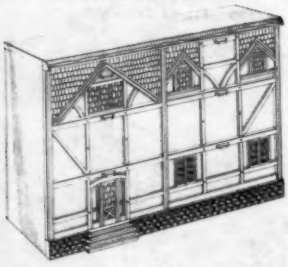
267,843
RACK FOR APPLIANCES OR THE LIKE
Darrell W. Sundberg, 2110 Hamline North, Roseville, Minn. 55113
Filed Jul. 20, 1979, Ser. No. 59,481
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—132



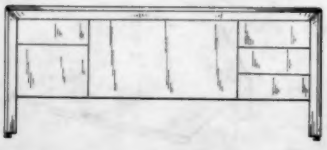
267,844
SHELF
Piet Cohen, Amsterdam, Netherlands, assignor to Materias Plasticas, Limitada, Leiria, Portugal
Filed Nov. 4, 1980, Ser. No. 204,026
Claims priority, application Portugal, May 9, 1980, 15,092
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



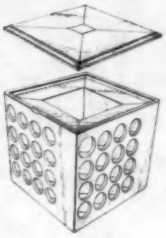
267,845
DRESSER OR SIMILAR ARTICLE
Sidney A. Lenger, Jr., Jamestown, N.C., assignor to The Singer Company, Stamford, Conn.
Filed Sep. 12, 1980, Ser. No. 186,816
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154



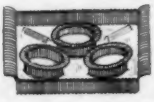
267,846
DESK OR SIMILAR ARTICLE
Warren Platner, Guilford, Conn., assignor to Litton Business Systems, Inc., Burlington, Iowa
Division of Ser. No. 914,285, Jun. 9, 1978. This application Jan. 9, 1981, Ser. No. 223,753
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



267,847
COMBINED SPICE RACK AND STORAGE UNIT
Fred T. Pielert, 4804 Washburn Ave. South, Minneapolis, Minn. 55410
Filed Nov. 13, 1980, Ser. No. 206,457
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—188



267,848
COMBINED SERVING TRAY AND CONDIMENT DISHES
Jeanette M. Dowling, 11521 Torrey Rd., Fenton, Mich. 48430
Filed Feb. 1, 1980, Ser. No. 117,431
Term of patent 14 years
Int. Cl. D07—*06, 99*
U.S. Cl. D7—3



267,849

EMBOSSED BEVERAGE OR PACKAGING CUP

Van D. Groenewold; Hubert E. Christian, and James P. Schwartz, all of Phoenix, Ariz., assignors to Dart Industries Inc., Los Angeles, Calif.

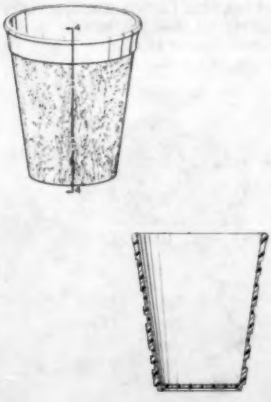
Filed Jan. 7, 1980, Ser. No. 110,023
Term of patent 14 years
Int. Cl. D07—*01*; D09—*03*
U.S. Cl. D7—6

267,850

EMBOSSED BEVERAGE OR PACKAGING CUP

Van D. Groenewold; Hubert E. Christian, and James P. Schwartz, all of Phoenix, Ariz., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Jan. 7, 1980, Ser. No. 110,054
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—6

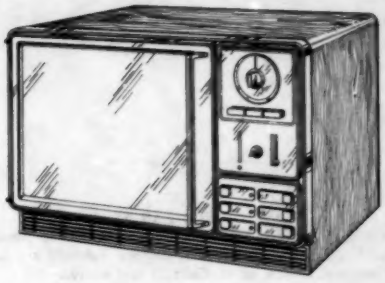


267,851

COMBINATION MICROWAVE AND CONVECTION OVEN

Melvin H. Boldt, Glenview; James P. Stevens, Oak Park, and Chester J. Wojtowicz, Prospect Heights, all of Ill., assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Oct. 14, 1980, Ser. No. 196,678
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—351

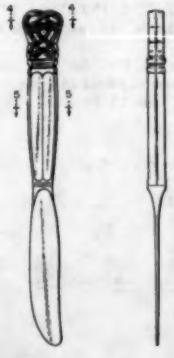


267,852

KNIFE OR SIMILAR ARTICLE

Bert England, Los Angeles, Calif., assignor to Towle Manufacturing Company, Boston, Mass.

Division of Ser. No. 33,572, Apr. 27, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 278,372
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137



267,853
GLASS CUTTER
Toshimitsu Arai, 2-3, 1-cho, Koryohigashi-machi, Sakai-shi, Osaka-fu, Japan
Filed Dec. 12, 1980, Ser. No. 215,930
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—51

267,854
FLASK OR SIMILAR ARTICLE
Frank H. Witt, Jr., Trumbull, Conn., assignor to Rosalie S. Levine, Trumbell; Mildred J. Bisacca, Fairfield and GRRN Company, Easton, all of, Conn., a part interest
Filed Oct. 15, 1980, Ser. No. 197,334
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—307

267,855
PRESSURIZED CONTAINER PISTON
Floyd R. French, St. Louis, Mo., assignor to Clayton Corporation, St. Louis, Mo.
Filed Apr. 28, 1980, Ser. No. 144,762
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—434

267,856
BEVERAGE DISPENSING CONTAINER
Jack R. Smith, Rte. #1, Box 172, Mineral Point, Mo. 63660
Filed May 1, 1980, Ser. No. 145,676
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—337

267,857
DISPLAY HOLDER
Barbara Astor, Pelham Manor, and Terry E. Snyder, New York, both of N.Y., assignors to Revlon, Inc., New York, N.Y.
Division of Ser. No. 19,444, Mar. 12, 1979. This application Jun. 23, 1981, Ser. No. 276,598
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345

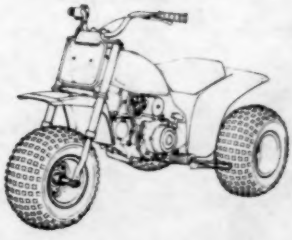
267,858
BOTTLE
Marian Spates, 2969 Lawton Pl., St. Louis, Mo. 63103
Filed Nov. 19, 1980, Ser. No. 208,242
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—373

267,859
RING WITH WATCH
Harumichi Kabaya, Tokyo, Japan, assignor to Citizen Watch Company, Limited, Tokyo, Japan
Filed Dec. 5, 1980, Ser. No. 213,508
Claims priority, application Japan, Jul. 21, 1980, 55-29416
Term of patent 14 years
Int. Cl. D10—*02*; D11—*01*
U.S. Cl. D10—31

267,860
WRIST WATCH
Harumichi Kabaya, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan
Filed Dec. 5, 1980, Ser. No. 213,510
Claims priority, application Japan, Jul. 21, 1980, 55-29415
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

267,861
WRISTWATCH
Eiichi Ohsawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Dec. 12, 1980, Ser. No. 216,017
Claims priority, application Japan, Jun. 20, 1980, 55-24638
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

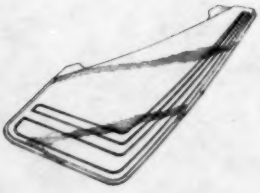
267,862
MOTOR TRICYCLE
Kazutaka Kimura, Kokubunji, and Mituru Yamamoto, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 27, 1981, Ser. No. 286,837
Claims priority, application Japan, Jan. 26, 1981, 56-2505
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



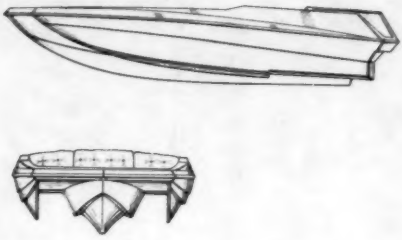
267,863
BABY STROLLER
Shinroku Nakao, Yokohama, and Kouichi Kobayashi, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Apr. 14, 1981, Ser. No. 254,333
Claims priority, application Japan, Nov. 13, 1980, 55-47523
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

267,864
MUDGUARD FOR A VEHICLE, OR SIMILAR ARTICLE
Toshiyuki Watanabe, 1-2-21 Motomiya, Tsurumi-Ku, Yokohama, Japan
Filed Jul. 14, 1980, Ser. No. 168,618
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185

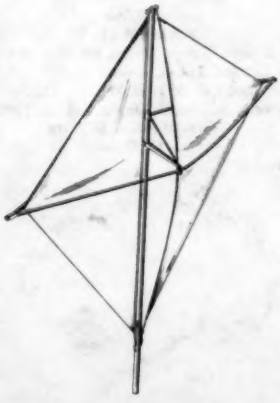
267,865
AUTOMOTIVE SPLASH GUARD
Jules P. Gross, Toronto, Canada, assignor to Pathfinder Auto Lamp Company, Niles, Ill. and National Rubber Company, Ltd., Toronto, Canada
Filed Jan. 26, 1981, Ser. No. 228,151
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



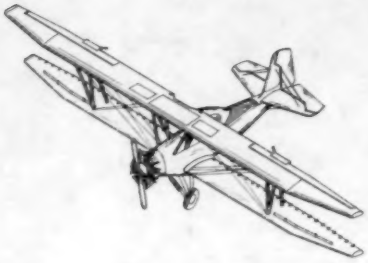
267,866
BOAT
Vaughan V. Parsons, 25640 Via Crotalo, Carmel, Calif. 93921
Filed May 23, 1980, Ser. No. 152,793
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—311



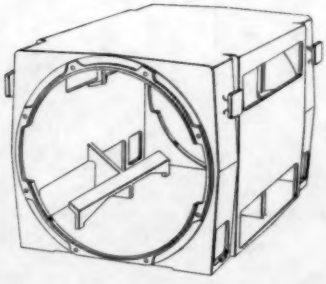
267,867
SAILING RIG
Floyd Marsden, Garden City, Ga., assignor to Barbara B. Marsden, Garden City, Ga.
Filed Feb. 27, 1980, Ser. No. 125,228
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—317



267,868
AGRICULTURAL SPRAY AIRPLANE
Weldon D. Wilson, Ada County, Id., assignor to Eagle Aircraft Company, Boise, Id.
Filed Jul. 2, 1979, Ser. No. 54,142
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—331

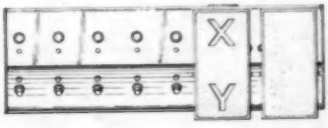


267,869
HOUSING FOR ELECTRIC MOTOR
Henry G. Lenz, and Earl K. Stewart, both of Schenectady, N.Y., assignors to General Electric Co., Schenectady, N.Y.
Filed Jun. 9, 1980, Ser. No. 157,577
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



267,870
CONTROL PANEL FOR ELEVATOR SYSTEMS
Ernest M. Bevilaqua, Wilton; Allan L. McCroskery, Weston, both of Conn., and Theodore N. Knerr, New York, N.Y., assignors to Otis Elevator Company, Farmington, Conn.
Filed Feb. 2, 1981, Ser. No. 230,840
Term of patent 14 years
Int. Cl. D10—*06*; D13—*03*
U.S. Cl. D13—35

267,871
FOOT OPERATED LIGHTING CONTROL
James H. Fackert, 9556 Firwood, South Lyon, Mich. 48178
Filed Jan. 5, 1981, Ser. No. 222,909
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—36



267,872
CAR TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 14, 1980, Ser. No. 168,001
Claims priority, application Japan, Jan. 21, 1980, 55-1065
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

267,873

BASE FOR A TELEPHONE SET

Wilbert C. Brown, Fairfield, and Philip B. Saba, Trumbull, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Filed Oct. 29, 1979, Ser. No. 88,980

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—60

267,874

CLOCK RADIO RECEIVER

Henderikus P. Schouten, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

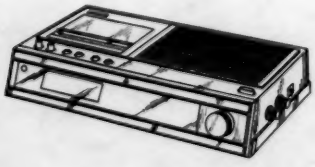
Filed Jul. 25, 1980, Ser. No. 172,318

Claims priority, application United Kingdom, Feb. 1, 1980, 993427

Term of patent 14 years

Int. Cl. D14—*03*; D10—*01*

U.S. Cl. D14—73



267,875

PROJECTION TELEVISION UNIT

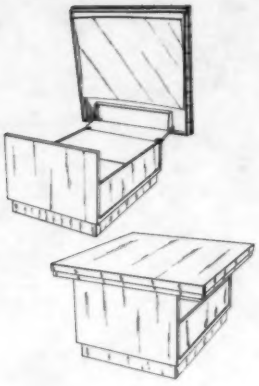
Bernard Mitchell, Upper Saddle River, N.J., and John F. Price, Peabody, Mass., assignors to Kloss Video Corporation, Cambridge, Mass.

Filed Feb. 13, 1981, Ser. No. 234,319

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—79



267,876

TELEVISION STATIC ELECTRICITY GROUNDING ROD

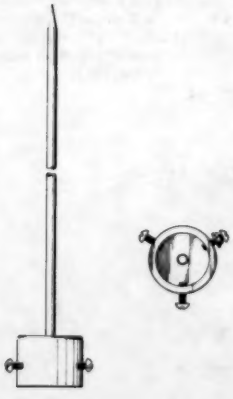
John K. Malmin, Carthage, Tex., assignor to Walter Parker, Carthage, Tex., a part interest

Filed Jun. 25, 1980, Ser. No. 162,773

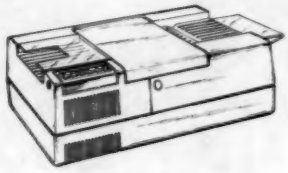
Term of patent 14 years

Int. Cl. D14—*99*

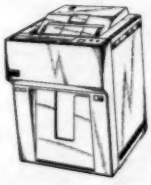
U.S. Cl. D14—90



267,877
FACSIMILIE TRANSCEIVER
Jens Reese, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 11, 1980, Ser. No. 158,626
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—94

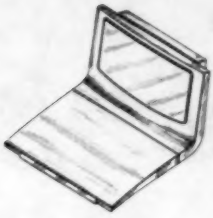


267,878
FACSIMILE TRANSCEIVER
Hideyuki Hosogai, Ueda; Akira Chiku, Komoro, and Toshihiro Kumano, Tobu, all of Japan, assignors to MatsushitaGraphic Communication System, Tokyo, Japan
Filed Jun. 25, 1980, Ser. No. 163,232
Claims priority, application Japan, Dec. 28, 1979, 54-55535
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—94

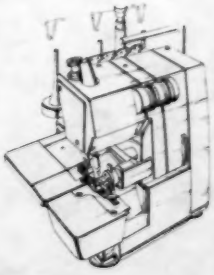


267,879
COMPUTER KEYBOARD OR SIMILAR ARTICLE
Leroy B. Keely, Sunnyvale; Michael J. Nuttall, and William G. Moggridge, both of Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.
Filed Oct. 20, 1980, Ser. No. 198,765
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

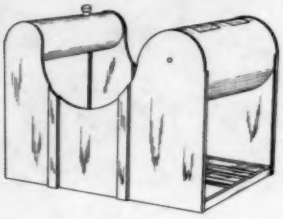
267,880
DISPLAY TERMINAL OR SIMILAR ARTICLE
Eric J. Marshall, 5 Carlton Gardens, London SW1, England
Filed Feb. 25, 1980, Ser. No. 124,648
Claims priority, application United Kingdom, Aug. 28, 1979, 991322
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113



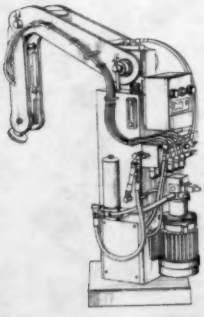
267,881
SEWING MACHINE
Wayne A. Current, Holmdel, N.J., assignor to The Singer Company, Stamford, Conn.
Filed Aug. 11, 1980, Ser. No. 176,828
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—68



267,882
COMBINED TANKS AND SUPPORTING STRUCTURE FOR WATERBLAST APPARATUS
Frank N. Winter, 23588 Connecticut St., Hayward, Calif. 94545
Filed Aug. 11, 1980, Ser. No. 176,715
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

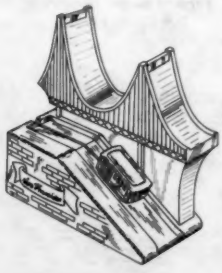


267,883
INDUSTRIAL ROBOT
Kenneth J. Susajara, Santa Claus, Ind., assignor to Thermwood Corporation, Dale, Ind.
Filed Sep. 12, 1980, Ser. No. 186,638
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



267,884
MIRROR REFLEX CAMERA
Hans-Kurt Uellenberg, Edingen, and Heinrich Janke, Braunfels, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Filed Jun. 3, 1980, Ser. No. 156,171
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—8

267,885
MUSIC BOX
Chong T. Ahn, 923 Fulton Ave., San Leandro, Calif. 94577
Filed Aug. 13, 1981, Ser. No. 292,707
Term of patent 14 years
Int. Cl. D17—*05*
U.S. Cl. D17—24

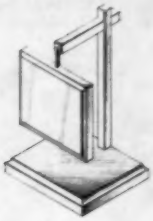


267,886
FIBER TIPPED PEN
Sauro Albertini, 6780 Airolo, Switzerland
Filed Jul. 25, 1980, Ser. No. 172,642
Claims priority, application Switzerland, Jan. 25, 1980, 110936
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43

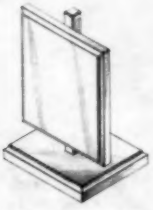
267,887
PEN
Herbert Rigoni, Niedereschacher Strasse 153, 7732 Fischbach, Fed. Rep. of Germany
Filed Aug. 28, 1980, Ser. No. 182,320
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, MR 1118
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

267,888
DECAL OR SIMILAR ARTICLE FOR A VEHICLE BODY
Eunice C. Williams, 1116 Washington, Oak Park, Ill. 60302
Filed Feb. 27, 1981, Ser. No. 237,425
Term of patent 14 years
Int. Cl. D19—*08*; D20—*99*
U.S. Cl. D20—11

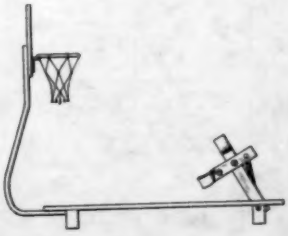
267,889
HANGING SIGN BOARD
Alfred P. Samuels, Jr., 2211 Forister Ct., Norman, Okla. 73069
Filed Dec. 1, 1980, Ser. No. 211,559
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—41



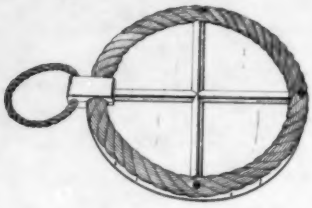
267,890
POST SUPPORTED SIGN BOARD
Alfred P. Samuels, Jr., 2211 Forister Ct. E., Norman, Okla. 73069
Filed Dec. 1, 1980, Ser. No. 211,861
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—41



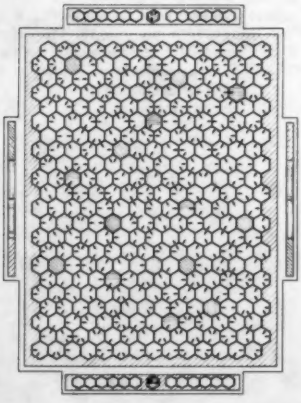
267,891
BASKETBALL SHOOTING TOY
Ellis R. Hailey, 3614 Johnston Way, Louisville, Ky. 40220
Filed Jan. 16, 1980, Ser. No. 112,516
The portion of the term of this patent subsequent to Oct. 30, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—2



267,892
BOARD FOR PLAYING GAMES
Ulf M. Hanses, Trädgardsgatan 2, S-781 31 Borlänge, and Kerstin M. Hagland, Herrhagsrägen 525, S-791 75 Falun, both of Sweden
Filed Dec. 15, 1980, Ser. No. 216,179
Claims priority, application Sweden, Jun. 13, 1980, 80-1214
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—16

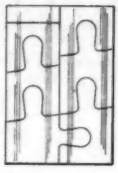


267,893
GAME BOARD
Sharon E. Zeldin, 38506 Calle De La Siesta, Murrieta Hot Springs, Calif. 92362
Filed Dec. 5, 1980, Ser. No. 213,556
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—33



267,894
KINETIC SCULPTURE
Hidetoshi Matsui, 6, Imazunaka 3-chome, Tsurumi-ku, Osaka 538, Japan
Filed Apr. 11, 1979, Ser. No. 29,691
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—102

267,895
PUZZLE
Patrick Petrie, 12210 Malone St., Los Angeles, Calif. 90066
Filed Apr. 10, 1980, Ser. No. 138,841
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—105



267,896
WHEELED TOY FIGURE
Michael W. Nuttall, South Padadena, Calif., and Yuichi Takahashi, Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 25, 1980, Ser. No. 143,722
Claims priority, application Japan, Oct. 25, 1979, 54-44899
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—161

267,897

FORCED AIR WASTE OIL INCINERATOR

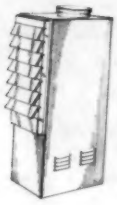
Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed Oct. 14, 1980, Ser. No. 196,940

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—92



267,898

FACIAL SAUNA

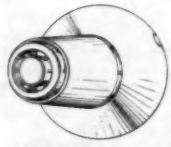
Paul D. Burian, Elmsford, N.Y., and Meyrick K. Rogers, Lancaster, Pa., assignors to Clairol Incorporated, New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,634

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—148



267,899

ELECTRONIC STROBOSCOPIC LIGHT

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Flik, Inc., Cambridge, Mass.

Filed Jun. 20, 1980, Ser. No. 161,275

Term of patent 14 years

Int. Cl. D10—*06*; D26—*02*

U.S. Cl. D26—40

267,900

LIGHTING FIXTURE

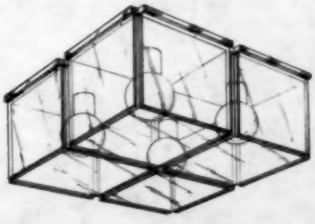
Motoko Ishii, Tokyo, Japan, assignor to Motoko Ishii Lighting Design Incorporated, Tokyo, Japan

Filed Aug. 6, 1979, Ser. No. 64,473

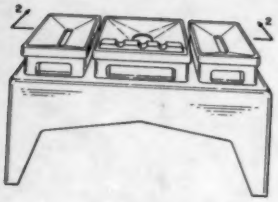
Term of patent 14 years

Int. Cl. D26—*05*

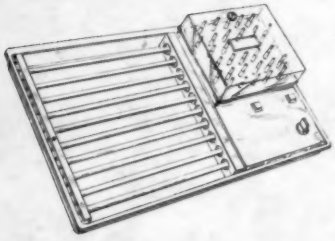
U.S. Cl. D26—83



267,901
LIQUID ASHTRAY
Forrest C. Johnstonbaugh, Box 133 AA, R.D., Petersburg, Pa. 16669
Filed Oct. 1, 1980, Ser. No. 192,930
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—08

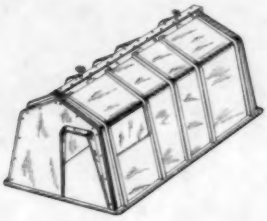


267,902
HAIR STYLING UNIT CONTAINER
Edward H. Meisner, Wyckoff, N.J., and John R. Forsberg, Arlington Heights, Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.
Filed Oct. 9, 1980, Ser. No. 195,655
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—11

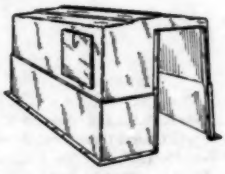


267,903
POCKET CARRYING CASE
Bennett L. Heck, 7920 Courtland, Elmwood Park, Ill. 60635
Continuation of Ser. No. 945,570, Sep. 25, 1978, abandoned. This application Dec. 24, 1980, Ser. No. 220,115
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—79

267,904
ANIMAL SHELTER
Lance T. Hampel, Germantown, and Roger R. Sacia, West Bend, both of Wis., assignors to L. T. Hampel Corp., Germantown, Wis.
Filed Nov. 24, 1980, Ser. No. 209,953
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



267,905
ANIMAL SHELTER
Alfred H. Keith, Minneapolis, Minn., assignor to Dairy Farm Leasing Company, Minneapolis, Minn.
Filed Mar. 27, 1981, Ser. No. 248,220
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



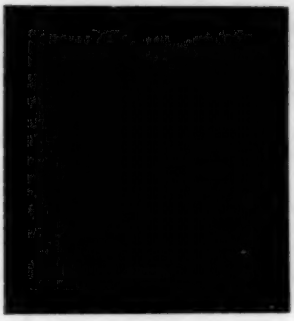
267,906
ELECTRIFIED VACUUM HOSE FOR A WET/DRY VACCUM CLEANER
Carl Parise, and Rainer R. Schulz, both of Reno, Nev., assignors to Parise & Sons, Inc., Sparks, Nev.
Filed Oct. 8, 1980, Ser. No. 195,270
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—31

267,907

EMBOSSED PAPER TOWELING

Galyn A. Schulz, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 6, 1981, Ser. No. 232,216
Term of patent 14 years
Int. Cl. D5—06
U.S. Cl. D59—2 B



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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Menarini S.A.S.: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., 4,372,958, Cl. 424-253.000.

A. Michael S.A.: *See*—
Uebelhart, Walter; Gilomen, Beat; and Parel, Claude, 4,372,108, Cl. 57-358.000.

A.P.V. Company Limited, The: *See*—
Bond, Michael P., 4,372,375, Cl. 165-70.000.

A/S Niro Atomizer: *See*—
Gude, Klaus E.; Felsvang, Karsten S.; and Coe, Everett L., 4,372,926, Cl. 423-244.000.

AAR Corp.: *See*—
Naffa, Faisal A., 4,372,715, Cl. 410-79.000.

Aaroe, Kenneth T. Humbucking electromagnetic pickup for stringed musical instruments. 4,372,186, Cl. 84-1.150.

AB Laboratories, a limited partnership: *See*—
Berg, Arne L., 4,372,187, Cl. 84-1.160.

AB Myometricon: *See*—
Akerlund, Mats, 4,372,302, Cl. 128-130.000.

Abbott Laboratories: *See*—
Genese, Joseph N.; and Muetterties, Andrew J., 4,372,306, Cl. 128-214.00G.

Abe, Masaharu: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.

Abe, Osamu: *See*—
Ishii, Toshio; Mouri, Yasunori; Abe, Osamu; and Hasegawa, Taiji, 4,373,187, Cl. 364-431.060.

Abolins, Visvaldis; and Luxon, Bruce A., to General Electric Company. Polyphenylene ether compositions. 4,373,052, Cl. 524-451.000.

Aboussafy, John: *See*—
Kulhanek, Emanuel; and Aboussafy, John, 4,372,379, Cl. 166-68.500.

Abrahamsson, Kjell E.: *See*—
Samuelson, Hans O.; and Abrahamsson, Kjell E., 4,372,811, Cl. 162-38.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,372,025, Cl. 29-407.000.

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Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., to Ford Motor Company. Thin-walled exhaust gas manifold casting. 4,372,112, Cl. 60-323.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,372,437, Cl. 198-380.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Gauging assembly for capsule orienting and turning apparatus. 4,372,437, Cl. 198-380.000.

Acme Engineering & Manufacturing Corporation: *See*—
Augsburger, Norman D., 4,372,197, Cl. 98-118.000.

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Adams, Graham L., to Lucas Industries Limited. Fuel pumping apparatus. 4,372,267, Cl. 123-366.000.

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Adams, Ronald W.: *See*—
Smith, Gerald J.; and Adams, Ronald W., 4,373,001, Cl. 428-212.000.

Adickes, Henning, to Deere & Company. Tractor. 4,372,577, Cl. 280-780.000.

Admore, Inc.: *See*—
Hanlon, Albert W., 4,372,086, Cl. 52-36.000.

Advance Metalworking Co., The: *See*—
Verschage, Richard, 4,372,572, Cl. 280-423.00B.

Advanced Energy Systems, Inc.: *See*—
Anderson, David H.; and Lucas, Eugene F., 4,372,414, Cl. 180-165.000.

Affolder, Steven L., to CTS Corporation. Process for controlling the movement of press components. 4,372,903, Cl. 264-109.000.

Ahlberg, Lloyd A.: *See*—
Tittmann, Bernhard R.; Ahlberg, Lloyd A.; and Elsley, Richard K., 4,372,163, Cl. 73-602.000.

Ahn, Byung K., to Koppers Company, Inc. Process for preparing arsenic acid. 4,372,828, Cl. 204-103.000.

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Baker, Roderick J., 4,372,371, Cl. 165-9.000.
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Amba, William J., 4,372,931, Cl. 423-329.000.
Klee, David J.; Lovette, Norris G., Jr.; Rupprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., 4,372,130, Cl. 62-330.000.
Miller, Gerald D., 4,372,447, Cl. 206-812.000.
Newton, Charles L.; and Fuini, Dennis L., 4,372,124, Cl. 60-648.000.
Theobald, Alan, 4,372,764, Cl. 62-13.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kobayashi, Hideyuki, 4,372,117, Cl. 60-562.000.

Ajeman, Matthew L.: *See*—
Dufresne, Raymond A., 4,372,636, Cl. 339-237.000.

Ajzert, Ilona K.: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.

Akerlund, Mats, to AB Myometricon. Instrument for retrieval of retracted threads of intrauterine contraceptive devices. 4,372,302, Cl. 128-130.000.

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Kitakami, Toshiyuki; and Akiyama, Yoshinori, 4,372,613, Cl. 297-481.000.

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Johansson, Lennart, 4,372,019, Cl. 29-1.230.

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Hutter, Wilhelm, 4,372,346, Cl. 139-353.000.

Albany International Corp.: *See*—
Smith, Gerald J.; and Adams, Ronald W., 4,373,001, Cl. 428-212.000.

Alberta Energy Company Ltd.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.

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Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,372,980, Cl. 426-231.000.

Alcorn, Candace J. Counter dispenser for cones. 4,372,465, Cl. 221-131.000.

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Alfa-Laval AB: *See*—
Fecske, Aurel J., 4,372,845, Cl. 209-211.000.

Allardt, Clark E.: *See*—
Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.

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Allen Group Inc.: *See*—
Marshall, John P.; and Ruffer, Dennis A., 4,373,186, Cl. 364-551.000.

Allen, Richard B., to General Electric Company. Epoxy molding compound. 4,373,040, Cl. 523-466.000.

Allen, Terry S.; and Jacobson, Peter E., to Sperry Corporation. High current transfer roll ring assembly. 4,372,633, Cl. 339-5.00M.

Allied Corporation: *See*—
Preziosi, Anthony F.; Patel, Gordhanbhai N.; Denkewalter, Robert G.; and Baughman, Ray H., 4,373,032, Cl. 521-38.000.

Allis-Chalmers Corporation: *See*—
Hess, Paul D., 4,372,784, Cl. 106-100.000.

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Biasini, Americole R., 4,372,518, Cl. 248-441.00R.

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Virk, Kashmir S.; and Alperstein, Martin, 4,372,111, Cl. 60-274.000.

Aluminum Pechiney: *See*—
Bocourt, Francois; and Fetaud, Henri, 4,372,541, Cl. 266-220.000.

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Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,373,026, Cl. 435-191.000.

AMBAC Industries, Incorporated: *See*—
McMillen, Bobby E., 4,372,035, Cl. 29-596.000.

Ambrose, Frank. Sole body for shoes with upwardly deformable arch-supporting segment. 4,372,059, Cl. 36-32.00R.

Ambrus, Gabor; Toth-Sarady, Eva; Cseh, Gyorgy; Barta, Istvan; and Horvath, Gyula, to Gyogyszerkutato Intezet. 16-Amino-postaglandin derivatives, their acid addition salts, and a process for the preparation thereof. 4,372,973, Cl. 424-305.000.

Ambs, William J., to Air Products and Chemicals, Inc. Microcrystalline synthetic faujasite. 4,372,931, Cl. 423-329.000.

Amchem Products, Inc.: *See—*
Steinbrecher, Lester; and Hall, Wilbur S., 4,373,050, Cl. 524-405.000.

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Dassler, Karl O.; and Langseder, Neal E., 4,372,462, Cl. 220-269.000.
Herdzina, Frank J.; Kossmann, Hans; and Lemke, Harold C., 4,372,720, Cl. 413-56.000.

American Dental Association Health Foundation: *See—*
Bowen, Rafael L., 4,373,035, Cl. 523-113.000.

American Hoechst Corporation: *See—*
Horner, Ellwood J., 4,372,677, Cl. 355-41.000.

American Home Products Corporation: *See—*
Kendall, Stanley E., 4,372,991, Cl. 427-140.000.

American Hospital Supply Corporation: *See—*
Grossmann, Frederic; and Sims, Larry A., 4,372,303, Cl. 128-132.00D.
Lane, Ernest, 4,372,743, Cl. 8-94.110.

American Optical Corporation: *See—*
Miller, Harold M., 4,372,917, Cl. 422-116.000.

American Sterilizer Company: *See—*
Chamberlain, Robert E.; and Cook, Thomas G., 4,372,916, Cl. 422-111.000.

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AMG Industries, Inc.: *See—*
Alexy, Fred H., 4,372,055, Cl. 34-110.000.

Ammonia Casale S.A.: *See—*
Zardi, Umberto, 4,372,920, Cl. 422-148.000.

AMP Incorporated: *See—*
Dola, Frank P., 4,373,155, Cl. 340-623.000.
Lane, David; Woodward, Mervin; and Kilpatrick, Jerry B., 4,372,637, Cl. 339-244.00R.
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., 4,372,634, Cl. 339-17.00C.
Schubert, Paul C.; and Thakrar, Ani' C., 4,373,048, Cl. 524-371.000.

Amrhein, Alan G.: *See—*
Krumwiede, John F.; and Amrhein, Alan G., 4,372,770, Cl. 65-27.000.

Andersen, Alan J.: *See—*
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,372,801, Cl. 156-434.000.

Anderson, David H.; and Lucas, Eugene F., to Advanced Energy Systems, Inc. Fuel-efficient energy storage automotive drive system. 4,372,414, Cl. 180-165.000.

Anderson Engineers, Inc.: *See—*
Anderson, Harry E.; and Heasley, Raymond E., 4,372,020, Cl. 29-81.00H.

Anderson, Harry E.; and Heasley, Raymond E., to Anderson Engineers, Inc. Slag removal apparatus. 4,372,020, Cl. 29-81.00H.

Anderson, Richard A.: *See—*
Matthews, William G.; Sicard, Jean-Paul; and Anderson, Richard A., 4,372,857, Cl. 210-673.000.

Anderson, Robert J.; and Hall, Glenn E., to Andersons, The. Dryer for particulate material. 4,372,053, Cl. 34-11.000.

Anderson, Stephen J., to Merrill Manufacturing Company. Yard hydrant. 4,372,339, Cl. 137-288.000.

Andersons, The: *See—*
Anderson, Robert J.; and Hall, Glenn E., 4,372,053, Cl. 34-11.000.

Ando, Takao: *See—*
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.

Andrepont, John S., to Chicago Bridge & Iron Company. Apparatus and method for concentrating a liquid mixture by freezing the solvent. 4,372,766, Cl. 62-532.000.

Andresen, Herman J. Liquid cable. 4,372,118, Cl. 60-583.000.

Angelo Guala S.p.A.: *See—*
Guala, Piergiacomo, 4,372,456, Cl. 215-252.000.

Antonius, John I. Therapeutic game. 4,372,560, Cl. 273-408.000.

Apollo Hair Systems, Inc.: *See—*
Nelson, Charles W., 4,372,330, Cl. 132-53.000.

Applied Magnetics-Magnetic Head Division Corporation: *See—*
Martin, Richard T., 4,372,248, Cl. 118-720.000.

Arai, Kazuo: *See—*
Shimamoto, Takeshi; Arai, Kazuo; and Kobayashi, Kazutsugu, 4,372,558, Cl. 273-238.000.

Arai, Tadashi; Takahashi, Katsuhiro; Ishiguro, Kimiko; and Yokoyama, Koji, to Arai, Tadashi. Antibiotic saframycin S and process for producing the same. 4,372,947, Cl. 424-121.000.

Arai, Yoshi: *See—*
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.

Aranyos, Nereo. Flexible band clamp. 4,372,011, Cl. 24-20.0TT.

Aristoscot Designs Limited: *See—*
Dunlop, Peter B., 4,373,200, Cl. 369-263.000.

Armijo, Joseph S.; and Coffin, Louis F., Jr., to General Electric Company. Nuclear fuel element. 4,372,817, Cl. 376-417.000.

Arrabit, Pierre. Animal trap. 4,372,074, Cl. 43-69.000.

Arthur Schmid AG: *See—*
Principe, Viktor, 4,372,235, Cl. 112-273.000.

Artos Engineering Company: *See—*
Winkelman, John H., 4,372,041, Cl. 29-747.000.

Asahi Glass Company Ltd.: *See—*
Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, 4,372,938, Cl. 423-469.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Oshima, Fumio, 4,372,663, Cl. 354-286.000.

Asai, Mitsuko: *See—*
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,373,028, Cl. 435-253.000.

Asai, Yoshihiko; Hori, Masao; and Tokumitsu, Naoki, to Nippon Steel Corporation. Method of electroslag surfacing of components having a cylindrical surface. 4,373,128, Cl. 219-73.110.

Asami, Takayoshi: *See—*
Tamura, Shoichi; Asami, Takayoshi; and Sonoi, Hidekazu, 4,372,765, Cl. 62-29.000.

Asano, Yoshihiro; Morinaka, Akira; and Murase, Kei, to Nippon Telegraph & Telephone Public Corporation. Laser beam-recording media and method for manufacturing the same. 4,373,004, Cl. 428-328.000.

Aschauer, George R., to Twin Disc, Incorporated. Interleaved friction plate clutch having means to prevent plate wobble. 4,372,434, Cl. 192-85.0AA.

Ascherfeld, Margareta: *See—*
Fabinski, Walter; Deptolla, Udo; and Ascherfeld, Margareta, 4,373,137, Cl. 250-343.000.

Ashland Oil, Inc.: *See—*
Kyung, Jai H.; and Holehouse, Joseph G., 4,372,933, Cl. 423-365.000.
Kyung, Jai H.; and Brusky, Phyllis L., 4,372,934, Cl. 423-365.000.

Aslund, Christer; Eriksson, Hans; and Tornberg, Claes, to Granges Nyby AB. Casings and pressed parts utilized for the extrusion of articles, particularly pipes, and manufacturing process of such casings and pressed parts. 4,373,012, Cl. 428-558.000.

Astra Lakemedel Aktiebolag: *See—*
Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, 4,372,894, Cl. 260-941.000.

Astro-Arc Company: *See—*
Kazlauskas, Gasparas, 4,373,125, Cl. 219-60.00A.

Atari, Inc.: *See—*
Lee, Hugh, 4,372,007, Cl. 16-260.000.

Ateliers des Charmilles S.A.: *See—*
Lee, Marlow, 4,372,374, Cl. 165-70.000.

Atkinson, Francis S. Articulated erosion control system. 4,372,705, Cl. 405-19.000.

Atlantic Pipe Corporation: *See—*
Brown, William L.; and Toffolon, Roger L., 4,372,091, Cl. 52-593.000.

Atlantic Richfield Company: *See—*
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,372,861, Cl. 252-29.000.

Atlas Copco Aktiebolag: *See—*
Hansson, Gunnar C., 4,372,534, Cl. 254-269.000.

Atwood Vacuum Machine Co.: *See—*
Marx, Thomas O., 4,372,429, Cl. 188-322.120.

Augsburger, Norman D., to Acme Engineering & Manufacturing Corporation. Cold weather inlet for ventilating systems. 4,372,197, Cl. 98-118.000.

Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, to VEB Kombinat Textima. Device for separating flexible planar material. 4,372,548, Cl. 271-18.300.

Austin, Kenneth L. Thermal-gravity engine. 4,372,123, Cl. 60-639.000.

Automotive Products Limited: *See—*
Farrant, David J. R., 4,372,621, Cl. 308-2.00R.

Avakian, Emik A.; and Avakian, Souren, to Centaur Sciences, Inc. Flow control system and restrictor for use therein. 4,372,304, Cl. 128-214.00E.

Avakian, Souren: *See—*
Avakian, Emik A.; and Avakian, Souren, 4,372,304, Cl. 128-214.00E.

Avery International Corp.: *See—*
Sallenbach, M. Douglas, 4,372,681, Cl. 356-72.000.

Axelson, Simon E.: *See—*
Gillbrand, Per S.; Axelson, Simon E.; and Jiewertz, Sten R., 4,372,119, Cl. 60-600.000.

Azar, Jack C.; Henry, Arnold W.; and Ferguson, Robert M., to Xerox Corporation. Externally heated fusing member for electrostatographic copiers. 4,372,246, Cl. 118-60.000.

Azumi, Ichiro: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.

B.A.T. Cigaretten-Fabriken GmbH: *See—*
Kausch, Erwin; and Todter, Folkhard, 4,372,328, Cl. 131-332.000.

B. F. Goodrich Company, The: *See—*
Olson, Alan J.; and Vielhaber, Robert G., 4,373,093, Cl. 528-491.000.

Babcock, David H., to International Business Machines Corporation. Ribbon drive arrangement for a printer. 4,372,697, Cl. 400-232.000.

Bachinger, Peter. Process and apparatus for preparing fabric patterns. 4,372,499, Cl. 242-50.000.

Backlund, Peter S., to Union Oil Company of California. Sulfur suspensions. 4,372,872, Cl. 252-313.00R.

Bagby, John F., to Spin Physics, Inc. Method of manufacturing a single-track video ferrite record/reproduce head. 4,372,036, Cl. 29-603.000.

Bahder, George, to Cable Technology Laboratories, Inc. Extension of cable life. 4,372,988, Cl. 427-52.000.

Bailey, Curtis R., to Machine Products Corporation. Coil guide member for coil insertion tool. 4,372,039, Cl. 29-734.000.

Bailey, Robert F., to Rockwell International Corporation. Ion implantation for hard bubble suppression. 4,372,985, Cl. 427-38.000.

Baker, Arthur L. Wood burning stove. 4,372,286, Cl. 126-77.000.

Baker CAC, Inc.: *See*—
Goans, Kip B., 4,372,333, Cl. 137-1.000.

Baker Instruments Corp.: *See*—
Parker, Bernard, 4,372,175, Cl. 73-864.170.

Baker International Corporation: *See*—
Baker, John R., 4,372,393, Cl. 166-382.000.
Beimgraben, Herbert W., 4,372,400, Cl. 175-107.000.

Baker, John R., to Baker International Corporation. Casing bore receptacle. 4,372,393, Cl. 166-382.000.

Baker Manufacturing Company: *See*—
Lien, Neil C., 4,372,565, Cl. 277-236.000.

Baker, Roderick J., to Air Preheater Company, Inc., The. Trunnion air seal. 4,372,371, Cl. 165-9.000.

Baker, Wayne. Engine fluid heater. 4,372,260, Cl. 123-142.50E.

Balbuena, Dora O. Combined book, flannelboard and hand puppet. 4,372,077, Cl. 46-116.000.

Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG: *See*—
Lange, Karl-Heinz, 4,372,661, Cl. 354-204.000.

Baldanello, Umberto; and Zottino, Giuseppe. Roller blinds. 4,372,367, Cl. 160-310.000.

Balfanz, Fredrick J., to C-R-O, Inc. Metal cutting machine with cut piece pickup and transport magnets. 4,372,538, Cl. 266-69.000.

Balka, William J., Jr. Ball serving apparatus having independently operating horizontal and vertical firing barrel oscillating means. 4,372,283, Cl. 124-56.000.

Ball, David N., to Graviner Limited. Fire and explosion detection. 4,373,136, Cl. 250-339.000.

Balme, Michael J.; and Edwards, David T., to Racal Recorders Ltd. Data encoding and/or decoding. 4,373,154, Cl. 340-347.0DD.

Bandag Incorporated: *See*—
Dugger, Doyle L., 4,372,366, Cl. 157-13.000.

Barber, James C., to James C. Barber and Associates, Inc. Energy conservation and pollution abatement at phosphorus furnaces. 4,372,929, Cl. 423-323.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Oberstrass, Detlev, 4,372,106, Cl. 57-334.000.

Barnes, David I.: *See*—
Robinson, Joseph G.; and Barnes, David I., 4,373,089, Cl. 528-353.000.

Barnes Engineering Company: *See*—
Buckley, Robert E., 4,372,691, Cl. 374-44.000.

Barnett, Lawrence; Cordoba, Julio; and Nuzzo, Benjamin. Vehicular anti-theft locking system. 4,372,419, Cl. 180-289.000.

Barnhouse, Richard A.: *See*—
Le Grand, Alexander J.; and Barnhouse, Richard A., 4,372,444, Cl. 206-505.000.

Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., to Bell Telephone Laboratories, Incorporated. Purification process for compounds useful in optical fiber manufacture. 4,372,834, Cl. 204-157.10R.

Barrington, Burchus Q.; Clayton, Wilbur P.; and Jackson, Gerald D., to Halliburton Company. Screw operated emergency relief and safety valve. 4,372,391, Cl. 166-373.000.

Barrington, Burchus Q.; and Clayton, Wilbur P., to Halliburton Company. Full opening emergency relief and safety valve. 4,372,392, Cl. 166-373.000.

Barta, Istvan: *See*—
Ambrus, Gabor; Toth-Sarudy, Eva; Cseh, Gyorgy; Barta, Istvan; and Horvath, Gyula, 4,372,973, Cl. 424-305.000.

Bartholomew, Bruce J., to General Dynamics Corporation/Convair Div. Holographic apparatus to measure the surface figure of a nonlinear axicon and other optical elements. 4,372,684, Cl. 356-348.000.

Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., to Orcon Corporation. Fill strand transfer apparatus for making non woven fabrics. 4,372,801, Cl. 156-434.000.

BASF Aktiengesellschaft: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,372,885, Cl. 260-158.000.
Neumann, Peter; Elser, Wolfgang; Bock, Gustav; and Kermer, Wolf-Dieter, 4,373,102, Cl. 544-143.000.
Rohr, Wolfgang; Schirmer, Ulrich; and Wuerzer, Bruno, 4,373,105, Cl. 560-27.000.

Basic Line, Inc.: *See*—
Licari, Vito; and Licari, Yaffa, 4,372,450, Cl. 211-87.000.

Basile, Rocco F.; Blum, Kenneth P.; and Cole, John M., to Thomas & Betts Corporation. Optical fiber cleaver with puller. 4,372,048, Cl. 30-124.000.

Bassist, Rudolph G. Apparatus for feeding filling threads to a wrap knitting machine. 4,372,132, Cl. 66-84.00A.

Bauer, Gerald L.: *See*—
Brandenburg, Bruce L.; and Bauer, Gerald L., 4,372,940, Cl. 423-567.00A.

Bauer, Heinz, to Societe D'Assistance Technique Pour Produits Nestle S.A. Process for improving the consistency of a reconstituted instant puree. 4,372,984, Cl. 426-637.000.

Baugh, John L.; Montgomery, James W.; and Roach, Malcolm B., to Hughes Tool Company. Well valve. 4,372,390, Cl. 166-373.000.

Baughman, Ray H.: *See*—
Preziosi, Anthony F.; Patel, Gordhanbhai N.; Denkewalter, Robert G.; and Baughman, Ray H., 4,373,032, Cl. 521-38.000.

Baum, Gunter. Device for vacuum sealing of preserving jars. 4,372,096, Cl. 53-88.000.

Baumann, Jack, to Look International Enterprises, Inc. Method of installing a scalp anchor for a hairpiece. 4,372,317, Cl. 128-330.000.

Baxter, Richard V., Jr.: *See*—
Pomerantz, Daniel I.; and Baxter, Richard V., Jr., 4,372,054, Cl. 34-44.000.

Baxter Travenol Laboratories, Inc.: *See*—
Miller, Robert A.; Larson, Kenneth W.; and Schopen, Joseph L., 4,372,100, Cl. 53-428.000.

Bayer Aktiengesellschaft: *See*—
Hildebrand, Dietrich; and Haas, Franz, 4,372,744, Cl. 8-400.000.
Nachtkamp, Klaus; Bock, Manfred; Mennicken, Gerhard; and Pedain, Josef, 4,373,081, Cl. 528-45.000.
Reichmann, Wolfgang; Konig, Klaus; and Schonfelder, Manfred, 4,373,080, Cl. 528-45.000.

BDM Corporation, The: *See*—
Powers, Jerrold V., Jr., 4,372,378, Cl. 166-57.000.

Bearden, Roby; and Stuntz, Gordon F., to Exxon Research and Engineering Co. Process for reducing coke formation in heavy feed catalytic cracking. 4,372,840, Cl. 208-113.000.

Bearden, Roby: *See*—
Stuntz, Gordon F.; and Bearden, Roby, 4,372,841, Cl. 208-113.000.

Beck, Harald. Modular interlocking block construction toy. 4,372,076, Cl. 46-20.000.

Becker, Wilhelm: *See*—
Wojtech, Bernhard; Kiesling, Hans-Joachim; Becker, Wilhelm; and Hermann, Kurt, 4,373,073, Cl. 525-507.000.

Beckman Instruments, Inc.: *See*—
Neti, Radhakrishna M.; and Rocks, Raymond E., 4,372,915, Cl. 422-91.000.
Stephens, Donald E.; and Ehret, Robert J., 4,372,150, Cl. 73-40.50R.
Sternberg, James C., 4,372,683, Cl. 356-338.000.
Wright, Herschel E., 4,372,483, Cl. 494-16.000.

Beecham Group Limited: *See*—
Davies, John S.; and Brooks, Gerald, 4,372,962, Cl. 424-272.000.
Howarth, Thomas T.; and Hunt, Eric, 4,372,946, Cl. 424-114.000.

Beecham Inc.: *See*—
Cimiluca, Paul A., 4,372,942, Cl. 424-16.000.

Beecham-Wulfing GmbH & Co. KG: *See*—
Goring, Joachim E., 4,372,959, Cl. 424-253.000.

Beeman, Archie W. Eccentric rotary bit. 4,372,403, Cl. 175-343.000.

Beese, Miki E. Locking device. 4,372,592, Cl. 292-288.000.

Beesley, Graham E., to Motorola, Inc. Detectors. 4,373,139, Cl. 307-350.000.

Behle, Gunter R., to ACF Industries, Incorporated. Light source to locate nozzle in tank. 4,372,025, Cl. 29-407.000.

Behringwerke Aktiengesellschaft: *See*—
Habenstein, Klaus, 4,372,746, Cl. 436-66.000.

Beimgraben, Herbert W., to Baker International Corporation. Apparatus for applying pressure to fluid seals. 4,372,400, Cl. 175-107.000.

Belisomi, Pietro, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit arrangement for tuning into one of a number of radioelectric signals. 4,373,208, Cl. 455-186.000.

Bell & Howell Company: *See*—
Pfannkuch, Robert B.; and Grab, Fred W., 4,373,156, Cl. 340-703.000.

Bell, Robert L.: *See*—
Fisher, Alfred J., III; and Bell, Robert L., 4,372,610, Cl. 297-367.000.

Bell Telephone Laboratories, Incorporated: *See*—
Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., 4,372,834, Cl. 204-157.10R.
Brooks, Grant P., 4,373,204, Cl. 375-120.000.
Cubbison, Richard James, Jr., 4,373,118, Cl. 179-77.000.
Fulton, Theodore A.; and Hebard, Arthur F., 4,373,138, Cl. 307-277.000.
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., 4,372,535, Cl. 254-319.000.
Hecken, Rudolf P., 4,373,207, Cl. 455-139.000.
Johnson, Leo F.; and Van Uitert, LeGrand G., 4,372,641, Cl. 350-96.120.
Karabinis, Peter D.; and Miedema, Hotze, 4,373,210, Cl. 455-273.000.
Knowles, Susan F., 4,372,511, Cl. 248-68.00R.
Law, Henry H., 4,372,830, Cl. 204-110.000.
Liu, Pao-Lo P.; and Marcatili, Enrique A., 4,372,643, Cl. 350-96.140.
Miller, Stewart E., 4,372,645, Cl. 350-96.300.
Reichmanis, Elsa; Roman, Bernard J.; Tai, King L.; and Wilkins, Cletus W., Jr., 4,373,018, Cl. 430-312.000.
Sartori, Eugene F.; and Uhrhane, Francis J., 4,373,121, Cl. 179-175.30F.

Bellicardi, Francesco; and Vitto, Renato, to Weber S.p.A. Device adapted to correct the air-fuel ratio of the mixture delivered by a carburetor during the periods of operation at low loads of a motor vehicle engine. 4,372,896, Cl. 261-121.00B.

Beloit Corporation: *See*—
Powell, John E.; and Powell, Andrian J. C., 4,372,712, Cl. 406-153.000.
Benaquista, Florence. Treads. 4,372,056, Cl. 36-7.700.
Bender, Reinhold: *See*—
Linfeld, Robert; and Bender, Reinhold, 4,372,650, Cl. 350-252.000.
Bendix Corporation, The: *See*—
Elpern, David G.; and Casey, Gary L., 4,372,271, Cl. 123-445.000.
Harper, Peter W., 4,372,273, Cl. 123-490.000.
Walter, Richard P.; and Taplin, Lael B., 4,372,272, Cl. 123-467.000.
Benenate, Louis; and Spector, George. Power lawn mower with dumping receptacle. 4,372,064, Cl. 37-117.500.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, to Egyt Gyogyszervegyeszeti Gyar. Methyl-quinoxaline-1,4-dioxide derivatives. 4,373,100, Cl. 542-439.000.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, to Egyt Gyogyszervegyeszeti Gyar. Quinoxaline-2-yl ethenyl ketones. 4,373,101, Cl. 542-440.000.
Bennett, Benjamin R.; McBee, Leroy D.; and Horak, Richard F., to Moore & Hanks Co. Fail-safe refrigeration for continuous process. 4,372,129, Cl. 62-175.000.
Bennett, James G., Jr.; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether compositions. 4,373,064, Cl. 525-68.000.
Benscoter, Richard D.: *See*—
Myers, John L.; Benscoter, Richard D.; Chambers, Bruce B.; and Dyar, Ralph E., 4,373,111, Cl. 174-48.000.
Benson, Clark K.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Caridis, Anthony A., 4,372,200, Cl. 99-404.000.
Benson, Ronald K. Mailbox marking attachment. 4,372,481, Cl. 232-34.000.
Bentley Laboratories, Inc.: *See*—
Raible, Donald A., 4,372,914, Cl. 422-46.000.
Berdinner, Edward J., Jr., to International Business Machines Corporation. Shock absorbing carriage drive coupling for copier/duplicators. 4,372,671, Cl. 355-8.000.
Berend, Francis T., to Societe Anonyme Parinter. Gloves and a method of making thereof. 4,371,988, Cl. 2-167.000.
Berg, Arne L., to AB Laboratories, a limited partnership. Novel guitar-like electronic musical instrument. 4,372,187, Cl. 84-1.160.
Bergeron, D. L.; Fleming, Daniel J.; and Stephens, Geoffrey B., to International Business Machines Corporation. Schottky Barrier diode with controlled characteristics. 4,373,166, Cl. 357-15.000.
Berman, Herbert L.; and Sprout, James C., to Linear Corporation. Thermal radiation measuring arrangement. 4,372,690, Cl. 374-29.000.
Bernardin, Leo J.: *See*—
Fendler, Eleanor J.; and Bernardin, Leo J., 4,372,312, Cl. 128-290.00R.
Berneman, Armand; David, Alain; Horaud, Florian; and Segard, Emile. Microparticles, preparation thereof and applications thereof in biology, particularly in the culture of human diploid cells. 4,373,027, Cl. 435-240.000.
Bernhardsson, Ake A.; and Svensson, Kent A., to Saab-Scania Aktiebolag. Arrangement for switching a carburetor in internal combustion engines. 4,372,276, Cl. 123-525.000.
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, to Rohm GmbH Chemische Fabrik. Aqueous artificial resin dispersions free of emulsifying agents. 4,373,056, Cl. 524-547.000.
Betush, Frank A., to Progressive Machine Products, Inc. Pinch valve syringe. 4,372,307, Cl. 128-224.000.
Betz Laboratories, Inc.: *See*—
Snyder, William R.; and Feuerstein, Diane, 4,372,870, Cl. 252-180.000.
Bianchi, Valerio: *See*—
Latsch, Reinhard; and Bianchi, Valerio, 4,372,270, Cl. 123-440.000.
Biasini, Americole R., to Allsop, Inc. Music stand extender. 4,372,518, Cl. 248-441.00R.
Bic Corporation: *See*—
Dallaire, Michel J., 4,372,470, Cl. 224-324.000.
BICC Limited: *See*—
Dey, Philip; Gaylard, Bernard; and Taylor, David A., 4,372,792, Cl. 156-48.000.
Bielz, Siegfried; Janisch, Paul; and Lohrberg, Karl, to Metallgesellschaft Aktiengesellschaft. Process of producing chlorine dioxide. 4,372,939, Cl. 423-478.000.
Big Inch Marine Systems, Inc.: *See*—
Miller, Jack E., 4,372,584, Cl. 285-18.000.
Bills, Joseph W., Jr.: *See*—
Fredrickson, Ronald G.; and Bills, Joseph W., Jr., 4,372,727, Cl. 414-537.000.
BIORESEARCH S.r.l.: *See*—
Stramentinoli, Giorgio; and Gennari, Federico, 4,373,097, Cl. 536-26.000.
Bison-Werke Bahre & Greten GmbH & Co. KG: *See*—
Wiemann, Dieter; Seeger, Gunter; and Greten, Berndt, 4,372,899, Cl. 264-25.000.
Black, John W.; and Slager, Ralph E., to Pemco-Kalamazoo, Inc. Collet lock for a mold assembly. 4,372,738, Cl. 425-451.900.
Black, Philip W., to International Standard Electric Corporation. Optical fibres. 4,372,648, Cl. 350-96.330.
Blake, Joseph W., III; and Kaufman, Jack W. Surgical device. 4,372,316, Cl. 128-325.000.
Block Drug Company, Inc.: *See*—
Chang, Tiang-Shing; Zientek, Lucy J.; Viningauz, Arthur; and Scheps, Marcy L., 4,373,036, Cl. 523-120.000.
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,372,977, Cl. 424-342.000.
Blout, Bennett O., to Evans Products Company. Freight bracing bulkhead trolley and latching system. 4,372,716, Cl. 410-134.000.
Blum, Kenneth P.: *See*—
Basile, Rocco F.; Blum, Kenneth P.; and Cole, John M., 4,372,048, Cl. 30-124.000.
Blumenshine, Richard A., to Lely Independence Mfg., Inc. Sprayer boom structure. 4,372,492, Cl. 239-168.000.
Blythe, Robert J.: *See*—
Bond, Robert; and Blythe, Robert J., 4,373,069, Cl. 525-237.000.
Bo, Ermano; and Mathia, Tadeusz G. Method and apparatus for treating eutectic and eutectoid compositions. 4,372,781, Cl. 75-65.0ZM.
Boberg, Nils G. E.: *See*—
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Bock, Gustav: *See*—
Neumann, Peter; Elser, Wolfgang; Bock, Gustav; and Kerner, Wolf-Dieter, 4,373,102, Cl. 544-143.000.
Bock, Manfred: *See*—
Nachtkamp, Klaus; Bock, Manfred; Mennicken, Gerhard; and Pedain, Josef, 4,373,081, Cl. 528-45.000.
Bocourt, Francois; and Fetaud, Henri, to Aluminum Pechiney. Apparatus for treating a bath of liquid metal by injecting gas. 4,372,541, Cl. 266-220.000.
Boeder, Charles W., to Minnesota Mining and Manufacturing Company. Anaerobically curing compositions. 4,373,077, Cl. 526-309.000.
Boeing Company, The: *See*—
Burkam, John E., 4,373,169, Cl. 358-104.000.
Desjardins, Rene A., 4,372,431, Cl. 188-380.000.
Lambregts, Antonius A., 4,373,184, Cl. 364-434.000.
Pinson, George T.; and Hunter, Alex B., 4,372,216, Cl. 102-489.000.
Rhoton, William A., 4,372,015, Cl. 24-221.00R.
Ringis, Gerald A., 4,372,440, Cl. 198-728.000.
Syberg, Jan, 4,372,505, Cl. 244-53.00B.
Bohan, John E., Jr., to Honeywell Inc. Fail safe digital timer. 4,373,201, Cl. 371-68.000.
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Boisset, Bernard, to Societe Industrielle Bertrand Faure. Vehicle seats comprising a shell-shaped frame. 4,372,609, Cl. 297-362.000.
Bollinger, Parker A., Jr., to Siemens-Allis, Inc. Gear motor torque reaction absorber. 4,372,180, Cl. 74-606.00R.
Bolze, Manfred; and Drawert, Manfred, to Schering Aktiengesellschaft. Polyesteramide adhesives. 4,373,085, Cl. 528-291.000.
Bomback, John L., to Ford Motor Company. Method of determining vehicle misfueling. 4,372,748, Cl. 436-73.000.
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Bond, Robert; and Blythe, Robert J., to Dunlop Limited. Elastomer compositions. 4,373,069, Cl. 525-237.000.
Boon, John R.: *See*—
de Buda, Eric G.; Boon, John R.; and Dolbey, Michael P., 4,372,161, Cl. 73-432.00R.
Boorman, Roy S.: *See*—
Salter, Robert S.; Boorman, Roy S.; and Gilders, Ross D., 4,372,782, Cl. 75-118.00R.
Boretsky, Boris M.: *See*—
Sokolov, Sergei S.; Komovsky, Vadim R.; Vlasov, Leonid I.; Boretsky, Boris M.; and Shiryaev, Grigory V., 4,372,121, Cl. 60-606.000.
Borugian, Dennis A., to Eaton Corporation. Drum brake and retaining spring. 4,372,430, Cl. 188-329.000.
Boschetti, Giovanni. Process for simple, rapid and economical transformation of a window with a wooden or metal frame or a single pane frame into a window with a plurality of insulating panes. 4,372,094, Cl. 52-741.000.
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Tissot, Alain; and Bourlier, Claude, 4,372,225, Cl. 109-19.000.
Bovio, Michele; and Demonte, Filippo, to Ing. C. Olivetti & Co., S.p.A. Electronic pocket calculator. 4,372,694, Cl. 400-88.000.
Bowen, Rafael L., to American Dental Association Health Foundation. Isotonic monomer formulations. 4,373,035, Cl. 523-113.000.
Bower, Arnold B., Jr.; and Dillon, Robert E., to General Electric Company. Resin capsule and method for grouting anchor elements in holes of various lengths. 4,372,708, Cl. 405-261.000.
Boyle, John F.: *See*—
Klee, David J.; Lovette, Norris G., Jr.; Ruprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., 4,372,130, Cl. 62-330.000.

Bozsing, Daniel: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,100, Cl. 542-439.000.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,101, Cl. 542-440.000.

Bradbury, Bernard G., to Rexnord Inc. Positively driven steering member for conveying apparatus. 4,372,435, Cl. 198-356.000.

Bradley, Irving; and Vodicka, Vincent, to General Electric Company. Plastic PAR lamp construction. 4,372,794, Cl. 156-73.100.

Brandell, John T., to Halliburton Company. Downhole tool with ratchet. 4,372,387, Cl. 166-334.000.

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Brandt Industries, Inc.: *See*—
Brandt, Robert O., Jr., 4,372,171, Cl. 73-861.660.

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Brandt, Siegfried: *See*—
Disteldorf, Josef; Hubel, Werner; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,373,088, Cl. 528-338.000.

Branscum, Tony E., to Gott Corporation. Container holder. 4,372,453, Cl. 215-13.00R.

Brasa, Umberto. Doctor-blade support means for silk screen printing machine. 4,372,203, Cl. 101-124.000.

Brasfield, Bernard M., to Surgikos, Inc. Latex glove. 4,371,987, Cl. 2-162.000.

Braun, Gert, to Halbach & Braun. Chain having longitudinal stiffness used with hauling and cutting equipment. 4,372,619, Cl. 299-43.000.

Breazeale, Benjamin T., II: *See*—
Miller, John P. K., IV; and Breazeale, Benjamin T., II, 4,372,018, Cl. 27-35.000.

Breitenfellner, Franz: *See*—
Buxbaum, Lothar; and Breitenfellner, Franz, 4,373,044, Cl. 524-132.000.

Bresson, Clarence R.; and Parlman, Robert M., to Phillips Petroleum Company. Aromatic and benzothiophene extender oil composition for ore floatation. 4,372,844, Cl. 209-166.000.

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Mitchell, Robert K.; and Catterson, Robert K., 4,372,433, Cl. 192-18.00R.

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Ehlers, Joern; and Haukelt, Helmut, 4,372,866, Cl. 252-70.000.

Brochman, Wilfred R.; Hannula, Rodney R.; and Jorgensen, Bradley H., to Minnesota Mining and Manufacturing Company. Oil-resistant closure system. 4,372,460, Cl. 220-258.000.

Brooks, Gerald: *See*—
Davies, John S.; and Brooks, Gerald, 4,372,962, Cl. 424-272.000.

Brooks, Grant P., to Bell Telephone Laboratories, Incorporated. Phase locked loop timing recovery circuit. 4,373,204, Cl. 375-120.000.

Brown, Alphonso W., Jr. Compress roller curler. 4,372,329, Cl. 132-40.000.

Brown, Alton F.: *See*—
Marton, Renata; and Brown, Alton F., 4,372,495, Cl. 241-28.000.

Brown, Christopher R.; and Olsen, Everett O., to Foxboro Company, The. Industrial process control instrument employing a resonant sensor. 4,372,164, Cl. 73-704.000.

Brown, Gordon E. Phenol-resorcinol-formaldehyde resin. 4,373,062, Cl. 524-841.000.

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Brown, Marvin R.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute For Biological Studies, The. Pharmaceutically active peptides. 4,372,884, Cl. 260-112.50S.

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Cane, Albert; and Brown, Mitchell P., 4,372,741, Cl. 425-556.000.

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Browning Engineering Corporation: *See*—
Browning, James A., 4,372,732, Cl. 416-14.000.

Browning, James A., to Browning Engineering Corporation. Control mechanism for a windmill. 4,372,732, Cl. 416-14.000.

Bruns, Klaus: *See*—
Upadek, Horst; and Bruns, Klaus, 4,372,880, Cl. 252-522.00R.

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Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,372,301, Cl. 128-94.000.

Brusky, Phyllis L.: *See*—
Kyung, Jai H.; and Brusky, Phyllis L., 4,372,934, Cl. 423-365.000.

Bruzzese, Tiberio; and Ferrari, Lorenzo. Derivatives of rifamycins, their preparation and pharmaceutical compositions thereof. 4,372,961, Cl. 424-267.000.

Bryhn, Odd R.: *See*—
Reed, Marion G.; Loken, Tor; and Bryhn, Odd R., 4,372,786, Cl. 106-900.000.

Bubelis, Juozas: *See*—
Landa, Vaclav; Vitek, Jaromir; Nejedly, Pavel; Holpuch, Vladimir; Bubelis, Juozas; and Stepanovicius, Atanas-Nemezyus, 4,372,826, Cl. 204-43.00T.

Bucher, Bernard P.: *See*—
Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,372,967, Cl. 424-279.000.

Buckley, Robert E., to Barnes Engineering Company. Method and apparatus for determining the thermal resistance of a structure such as a wall ceiling or the like. 4,372,691, Cl. 374-44.000.

Budd Company, The: *See*—
Mekosh, George, Jr., 4,372,620, Cl. 303-99.000.
Skypala, Louis M., 4,372,510, Cl. 248-58.000.

Buffalo Color Corporation: *See*—
Marton, Renata; and Brown, Alton F., 4,372,495, Cl. 241-28.000.

Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhart, to Dynamit Nobel Aktiengesellschaft. Method for obtaining and reusing of oxidation catalyst in the Witten DMT process. 4,372,875, Cl. 252-413.000.

Burger, Jurgen: *See*—
Kasparek, Alois; and Burger, Jurgen, 4,372,710, Cl. 406-28.000.

Burger King Corporation: *See*—
Moore, Albert R., 4,372,354, Cl. 141-361.000.

Burkam, John E., to Boeing Company, The. Multi-window visual display system for flight simulators. 4,373,169, Cl. 358-104.000.

Burke, Robert L.: *See*—
Guditz, Elis A.; and Burke, Robert L., 4,372,996, Cl. 427-328.000.

Burnham, Francis L., to Orangeburg Technologies, Inc. Generating system utilizing multiple-stage small temperature differential heat-powered pumps. 4,372,114, Cl. 60-325.000.

Burns, Bruce P.: *See*—
Kirkendall, Richard D.; Drysdale, William H.; Kokinakis, Louise D.; and Burns, Bruce P., 4,372,217, Cl. 102-521.000.

Burroughs Corporation: *See*—
Holz, George E.; and Tezucar, Okan K., 4,373,157, Cl. 340-805.000.

Burroughs Wellcome Co.: *See*—
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,372,957, Cl. 424-251.000.

Buschbom, Floyd E.; Henke, Donald L.; and Hansen, Glen D., to Veda, Inc. Tilt control. 4,372,729, Cl. 414-700.000.

Bush, John R., to Research-Cottrell, Incorporated. Pollution control by spray dryer and electron beam treatment. 4,372,832, Cl. 204-157.10R.

Butler, Donald E., to Warner-Lambert Company. Use of dihydro-1H-pyrrolizine-3,5(2H,6H)-dione as a cognition activator. 4,372,966, Cl. 424-274.000.

Butler, James W.; Colvin, Alex D.; and Schuetzle, Dennis, to Ford Motor Company. Methods of monitoring a combustion system. 4,372,155, Cl. 73-114.000.

Butler Manufacturing Company: *See*—
Myers, John L.; Benscoter, Richard D.; Chambers, Bruce B.; and Dyar, Ralph E., 4,373,111, Cl. 174-48.000.

Buxbaum, Lothar; and Breitenfellner, Franz, to Ciba-Geigy Corporation. Flame-proofed plastics moulding compounds. 4,373,044, Cl. 524-132.000.

Byrum, Lyle M.: *See*—
Cronk, David; and Byrum, Lyle M., 4,372,506, Cl. 244-100.00R.

Bystedt, Hjalmar S. I., to Sunds Defibrator AB. Method and device for manufacturing mechanical pulp. 4,372,810, Cl. 162-23.000.

C-R-O, Inc.: *See*—
Balfanz, Fredrick J., 4,372,538, Cl. 266-69.000.

Cable Technology Laboratories, Inc.: *See*—
Bahder, George, 4,372,988, Cl. 427-52.000.

Caccioli, Anthony: *See*—
LaViolette, Paul A.; Caccioli, Anthony; Garcia, Alexander; Hotchkiss, Earl H.; and Marchitto, Alfred J., Jr., 4,372,016, Cl. 24-241.0PS.

Cachera, Pierre C., to Electricite de France (Service National). Method for flattening the curve of evolution of heat in a fast reactor core. 4,372,911, Cl. 376-349.000.

Calabrese, Richard A., to Pitney Bowes Inc. Cold pressure fusing apparatus. 4,372,247, Cl. 118-116.000.

Callahan, Ronald J.: *See*—
Strauss, Harry W.; Callahan, Ronald J.; and Froelich, Jerry W., 4,372,294, Cl. 128-1.100.

Callaway, Milton A., to Simmons U.S.A. Corporation. Hybrid flotation mattress having protecting, water proof liner. 4,371,998, Cl. 5-451.000.

Calnan, Thomas P. Support coupling for outdoor electrical junction box. 4,372,513, Cl. 248-146.000.

Cameron, Russell J., to Ross Operating Valve Company. Emergency brake for presses. 4,372,202, Cl. 100-53.000.

Camp, Douglas M.: *See*—
Stratta, Peter J.; Stratta, John G.; and Camp, Douglas M., 4,372,006, Cl. 16-105.000.

Campbell, James H., to Spare Trunk Corporation. Luggage and accessory trailer. 4,372,568, Cl. 280-63.000.

Canada-Cities Service, Ltd.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.

Cane, Albert; and Brown, Mitchell P., to Discovision Associates. Hot sprue valve assembly for an injection molding machine. 4,372,741, Cl. 425-556.000.

Canon Kabushiki Kaisha: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,372,655, Cl. 351-206.000.
Shimizu, Masami, 4,372,664, Cl. 354-288.000.
Tomosada, Masahiro; Kimura, Yoshimasa; and Sakamaki, Hisashi, 4,372,673, Cl. 355-14.00R.

Carbonisation Entreprise et Ceramique (C.E.C.): *See*—
Naturel, Christian; and Minot, Etienne, 4,372,494, Cl. 239-553.300.

Caridis, Andrew A.; Benson, Clark K.; and Caridis, Anthony A., to Heat and Control, Inc. Direct fired fryer with wiper means. 4,372,200, Cl. 99-404.000.

Caridis, Anthony A.: *See—*
Caridis, Andrew A.; Benson, Clark K.; and Caridis, Anthony A., 4,372,200, Cl. 99-404.000.

Carl Freudenberg, Firma: *See—*
Knoke, Jurgen; Jost, Manfred; Fahrbach, Erich; and Tecl, Bohuslav, 4,373,000, Cl. 428-198.000.

Carlmark, Rolf. Hang stand for unloading of backbone discs. 4,372,552, Cl. 272-112.000.

Carlson, Franklin J. Protective skirt assembly for a container. 4,372,458, Cl. 220-71.000.

Carlson, Linda A.: *See—*
Morgan, Steven R.; and Carlson, Linda A., 4,372,561, Cl. 273-411.000.

Carlson, William L., Jr., to General Signal Corporation. Torque compensated electric motor. 4,373,147, Cl. 318-48.000.

Carpenter, Vance J.; and Smith, Abbott, to Xerox Corporation. Precession scanning system. 4,372,670, Cl. 355-8.000.

Carruth, H. T., Jr., to Chevron Research Company. Updating and alerting method and apparatus associated with a microcomputer system for automatically indicating and recording parameters that spatially define locations of seismic exploration spread and source arrays. 4,373,198, Cl. 367-37.000.

Carter, Ernest E., Jr., to Halliburton Company. Inflatable packer with liquid resin anchored reinforcing sheath. 4,372,562, Cl. 277-34.000.

Caruthers, John E.; Jay, Robert L.; Riffel, Ronald E.; and Rothrock, Mark D., to General Motors Corporation. Aerodynamic data collection procedure. 4,372,157, Cl. 73-147.000.

Casadio, Sylvano: *See—*
Mouzin, Gilbert; Cousse, Henri; Stenger, Antoine; and Casadio, Sylvano, 4,372,975, Cl. 424-324.000.

Casey, Gary L.: *See—*
Elpern, David G.; and Casey, Gary L., 4,372,271, Cl. 123-445.000.

Castoe, John H. Valve adjustment apparatus. 4,372,023, Cl. 29-256.000.

Caterpillar Tractor Co.: *See—*
Hall, Lowell R., 4,372,193, Cl. 91-420.000.
Meismer, Richard A., 4,372,156, Cl. 73-119.00R.

Cattelani, Claude. Manual additive lamphouse for aerial images of caption stands and optical printers. 4,372,667, Cl. 355-1.000.

Catterson, Robert K.: *See—*
Mitchell, Robert K.; and Catterson, Robert K., 4,372,433, Cl. 192-18.00R.

Ceco Corporation, The: *See—*
Puckett, Hubert L., 4,372,022, Cl. 29-243.580.

Centaur Sciences, Inc.: *See—*
Avakian, Emik A.; and Avakian, Souren, 4,372,304, Cl. 128-214.00E.

Cervantes, Victoria. Hairdresser chair. 4,372,605, Cl. 297-192.000.

Chamberlain, Robert E.; and Cook, Thomas G., to American Sterilizer Company. Establishing and ascertaining desired air removal in steam sterilization. 4,372,916, Cl. 422-111.000.

Chambers, Bruce B.: *See—*
Myers, John L.; Benscoter, Richard D.; Chambers, Bruce B.; and Dyar, Ralph E., 4,373,111, Cl. 174-48.000.

Champion International Corporation: *See—*
Thompson, Kenneth P., 4,372,737, Cl. 425-393.000.

Champlin, Charles L.; Misura, John T.; and Reiser, Carl J., to Packaging Corporation of America. Air filter assembly. 4,372,763, Cl. 55-501.000.

Chan, Hak-Foon, to Rohm and Haas Company. N-Substituted alkynyl anilines. 4,372,972, Cl. 424-304.000.

Chandross, Edwin A.: *See—*
Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., 4,372,834, Cl. 204-157.10R.

Chang, Richard S.: *See—*
Minkoff, Michael D.; and Chang, Richard S., 4,372,556, Cl. 273-85.00G.

Chang, Tiang-Shing; Zientek, Lucy J.; Viningauz, Arthur; and Scheps, Marcy L., to Block Drug Company, Inc. Denture fixative composition. 4,373,036, Cl. 523-120.000.

Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., to Atlantic Richfield Company. Graphite dispersion. 4,372,861, Cl. 252-29.000.

Chapman, Wilson M.; and Jensen, Norman L., Jr., to Occidental Engineering Corporation. Coal-oil mixture apparatus. 4,372,751, Cl. 44-2.000.

Chatelet, Jean; Clerc, Michel; Coste, Andre; and Rigny, Paul, to Commissariat a l'Energie Atomique. Method of separating isotopes from a gas mixture. 4,372,928, Cl. 423-249.000.

Chatten, Victor H. Liquid operated clock. 4,372,688, Cl. 368-65.000.

Chatterjea, Probir K., to International Harvester Co. Clutch-clutch-brake steering mechanism for tractors. 4,372,408, Cl. 180-6.200.

Cheek, Alton E. Recirculating bearing antifriction system for well strings. 4,372,622, Cl. 308-4.00A.

Cheng, Dah Y.: *See—*
United States of America, National Aeronautics and Space Administration; and Cheng, Dah Y., 4,372,110, Cl. 60-262.000.

Chevron Research Company: *See—*
Carruth, H. T., Jr., 4,373,198, Cl. 367-37.000.
Gassaway, Gary S.; Scott, William R.; and Runge, Richard J., 4,373,197, Cl. 367-36.000.
Reed, Marion G.; Loken, Tor; and Bryhn, Odd R., 4,372,786, Cl. 106-900.000.

Chia, E. Henry, to Soutwire Company. Copper slag trap. 4,372,542, Cl. 266-229.000.

Chiao, Samuel Y., to NCR Corporation. Method of making coplanar MOS IC structures. 4,372,033, Cl. 29-571.000.

Chiba, Toshiyuki: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,372,952, Cl. 424-246.000.

Chicago Bridge & Iron Company: *See—*
Andrepont, John S., 4,372,766, Cl. 62-532.000.
Rothrock, Elmer W., 4,372,340, Cl. 137-576.000.
Stafford, Donald C., 4,372,344, Cl. 137-615.000.

Chicago Rawhide Manufacturing Company: *See—*
Lewis, Andrew D., 4,372,847, Cl. 210-86.000.

Children's Hospital Medical Center: *See—*
Gabbay, Kenneth; and Gallop, Paul M., 4,372,747, Cl. 436-67.000.

Chin, Sze L., to Grumman Aerospace Corporation. Peak detector. 4,373,140, Cl. 307-351.000.

Ching, Ta-Yen, to General Electric Company. Silicone coating for unprimed plastic substrate and coated articles. 4,373,060, Cl. 524-767.000.

Ching, Ta-Yen, to General Electric Company. Silicone coating for unprimed plastic substrate and coated articles. 4,373,061, Cl. 524-767.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara: *See—*
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.

Chisholm, Douglas R.; and Kurtz, Hobart L., Jr. Dynamic device address assignment mechanism for a data processing system. 4,373,181, Cl. 364-200.000.

Chisholm, William M., to Western Electric Company, Inc. Method of and apparatus for straightening terminal pins. 4,372,044, Cl. 29-845.000.

Chloride Group Limited: *See—*
Peters, Kenneth; and Culpin, Barry, 4,373,015, Cl. 429-57.000.

Chousa, Hirotaka: *See—*
Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, 4,372,319, Cl. 128-421.000.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6-, 1-And 2-substituted-thio-1-carbadethiapen-2-em-3-carboxylic acid S-oxides. 4,372,965, Cl. 424-274.000.

Chrysler Corporation: *See—*
Sarto, Jorma O., 4,372,261, Cl. 123-142.50E.

Chung, Rack H.; and Kray, William D., to General Electric Co. Silane-functionalized ultraviolet screen precursors. 4,372,835, Cl. 204-159.130.

Church, Peter K.; and Phillips, Alan G., to El-Chem Corporation. Rechargeable electrical storage battery with zinc anode and aqueous alkaline electrolyte. 4,372,823, Cl. 204-2.100.

Cianci, James P.: *See—*
Villari, Frank K.; and Cianci, James P., 4,372,313, Cl. 128-295.000.

Ciba-Geigy AG: *See—*
Ikin, John B.; and Neale, Denis M., deceased, 4,372,678, Cl. 355-37.000.

Ciba-Geigy Corporation: *See—*
Buxbaum, Lothar; and Breitenfellner, Franz, 4,373,044, Cl. 524-132.000.
Zink, Rudolf; and Loew, Peter, 4,372,886, Cl. 260-165.000.

Cicchetti, Osvaldo: *See—*
Gratani, Francesco; Nelli, Giuseppe; Di Battista, Piero; and Cicchetti, Osvaldo, 4,373,042, Cl. 524-100.000.

Cichos, Barbel: *See—*
Cichos, Claus, 4,372,088, Cl. 52-251.000.

Cichos, Claus, to Cichos, Barbel. Structure with slab beams. 4,372,088, Cl. 52-251.000.

Ciecior, Heinrich K., to Union Special G.m.b.H. Presser foot with cording attachment. 4,372,230, Cl. 112-139.000.

Cieutat, Bertrand G. Generating apparatus for a variable fluid pressure. 4,372,148, Cl. 73-4.00R.

Ciganko, David J., to Quaker Oats Company, The. Toy stitching set. 4,372,238, Cl. 112-439.000.

Cimiluca, Paul A., to Beecham Inc. Candy base and liquid center hard candy made therefrom. 4,372,942, Cl. 424-16.000.

City of Hope Research Institute: *See—*
Itakura, Keiichi, 4,373,071, Cl. 525-375.000.

Claim Guard Associates: *See—*
Leavitt, Alvan W.; and Primm, Alice E., 4,373,159, Cl. 343-6.50R.

Clarex Manufacturing Limited: *See—*
Gupta, Ramesh K., 4,373,033, Cl. 521-70.000.

Clark, Keith R.; and Focia, Michael, Jr., to Rheem Manufacturing Company. Method of manufacturing foam insulated tank. 4,372,028, Cl. 29-460.000.

Clayton, Wilbur P.: *See—*
Barrington, Burchus Q.; Clayton, Wilbur P.; and Jackson, Gerald D., 4,372,391, Cl. 166-373.000.
Barrington, Burchus Q.; and Clayton, Wilbur P., 4,372,392, Cl. 166-373.000.

Clerbois, Lucien; and Plumet, Lucien, to Interox (Societe Anonyme). Process for inhibiting the corrosion of equipment made of titanium. 4,372,813, Cl. 162-48.000.

Clerc, Michel: *See*—
Chatelet, Jean; Clerc, Michel; Coste, Andre; and Rigny, Paul, 4,372,928, Cl. 423-249.000.
Clerigues, Jack J. V. Installation for signalling deposit of mail in a letter box. 4,372,482, Cl. 232-36.000.
Clevepak Corporation: *See*—
Mandt, Mikkel G., 4,372,851, Cl. 210-199.000.
Clinicon Mannheim GmbH: *See*—
Nenninger, Klaus; and Van Rijckevorsel, Rainer, 4,372,682, Cl. 356-244.000.
Clyne, Nicholas; Stargeon, Philip L.; and Wright, Lawrence H. Method for producing a bill, apparatus for collecting items, and a self-service shop. 4,373,133, Cl. 235-383.000.
Coach and Car Equipment Corporation: *See*—
Feddeler, Lester H., 4,372,611, Cl. 297-371.000.
Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Barnes, David I., 4,373,089, Cl. 528-353.000.
Coca-Cola Company, The: *See*—
Le Caire, Robert A., Jr.; and Wendt, David W., 4,372,490, Cl. 239-59.000.
Cochran, Donald D., to National Can Corporation. Thin walled plastic container construction. 4,372,455, Cl. 215-100.00A.
Cocklin, Richard F. Spark plug wire gauge. 4,372,051, Cl. 33-174.00R.
Codimag: *See*—
Tison, Eric; and Herve, Paul, 4,372,206, Cl. 101-228.000.
Coe, Everett L.: *See*—
Gude, Klaus E.; Felsvang, Karsten S.; and Coe, Everett L., 4,372,926, Cl. 423-244.000.
Coffin, Louis F., Jr.: *See*—
Armijo, Joseph S.; and Coffin, Louis F., Jr., 4,372,817, Cl. 376-417.000.
Cohen, Stuart C.; and Dieck, Ronald L., to General Electric Company. Flame retardant thermoplastic compositions with reduced bloom. 4,373,047, Cl. 524-371.000.
Colamco, Inc.: *See*—
Hammond, James A., 4,373,057, Cl. 524-700.000.
Cole, John M.: *See*—
Basile, Rocco F.; Blum, Kenneth P.; and Cole, John M., 4,372,048, Cl. 30-124.000.
Coles, Donald K. Internal combustion engine. 4,372,269, Cl. 123-436.000.
Colgate-Palmolive Company: *See*—
Lancz, Albert J., 4,372,788, Cl. 134-4.000.
Collette, Wayne N., to Continental Group, Inc., The. Controlled feed of stabilizing rod associated with controlled application of blowing gas. 4,372,735, Cl. 425-135.000.
Collins, David A.; and Lile, Derek L., to United States of America, Navy. Normally off InP field effect transistor making process. 4,372,032, Cl. 29-571.000.
Colt Industries Operating Corp.: *See*—
Tice, Larry E., 4,372,222, Cl. 108-137.000.
Colvin, Alex D.: *See*—
Butler, James W.; Colvin, Alex D.; and Schuetzle, Dennis, 4,372,155, Cl. 73-114.000.
Combustion Engineering, Inc.: *See*—
Maliszewski, Theodore V., 4,372,496, Cl. 241-37.000.
Comeau, Joseph E. Fishing rod holder having dual mounting capabilities. 4,372,072, Cl. 43-21.200.
Commissariat a l'Energie Atomique: *See*—
Chatelet, Jean; Clerc, Michel; Coste, Andre; and Rigny, Paul, 4,372,928, Cl. 423-249.000.
Federspiel, Jean M., 4,372,545, Cl. 267-8.00R.
Concord Laboratories, Inc.: *See*—
Raitto, Russell G., 4,372,325, Cl. 128-763.000.
Conklin, James O. Sizing tool for dowel ends. 4,372,356, Cl. 142-56.000.
Connor, Michael S.: *See*—
Dolan, Francis H.; and Connor, Michael S., 4,372,734, Cl. 425-131.100.
Continental Disc Corporation: *See*—
Paul, Herman L., Jr., 4,372,334, Cl. 137-12.000.
Continental Group, Inc., The: *See*—
Collette, Wayne N., 4,372,735, Cl. 425-135.000.
Harned, Frederich C.; and Galloway, Scott M., 4,372,476, Cl. 229-16.00A.
Miller, Donald E., 4,372,146, Cl. 72-453.130.
Newman, Fred C., 4,372,459, Cl. 220-76.000.
Supik, Helmuth, 4,372,719, Cl. 413-9.000.
Control Data Corporation: *See*—
Peterson, Ralph W., 4,373,162, Cl. 343-771.000.
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., to Standard-Keil Hardware Mfg. Co., a Division of Buildex Inc. Safety latch. 4,372,591, Cl. 292-221.000.
Cook, Thomas G.: *See*—
Chamberlain, Robert E.; and Cook, Thomas G., 4,372,916, Cl. 422-111.000.
Cookson, Alan H., to Westinghouse Electric Corp. Method of assembling a gas-insulated power transmission line with duter enclosure of carbon steel and aluminum. 4,372,043, Cl. 29-828.000.
Cooley, Claude S. Dust collector and filter unit. 4,372,762, Cl. 55-273.000.
Cooney, Charles L.: *See*—
Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.
Cooper, David, to Marconi Company Limited. Antenna arrangements. 4,373,160, Cl. 343-100.0SA.
Cooper, Glenn D.; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether molding compositions that include an alkenyl aromatic resin, an ethylene propylene rubber and a triaryl phosphate. 4,373,045, Cl. 524-141.000.
Cooper, Leonard M.: *See*—
Kiedaisch, Randall A.; and Cooper, Leonard M., 4,372,599, Cl. 294-87.200.
Coppin, William P.: *See*—
Rollins, M. Jack; and Coppin, William P., 4,372,531, Cl. 251-174.000.
Coppola, Pasquale J.; and Dever, Gerald V., Jr., to Olin Corporation. Foam dispensing apparatus. 4,372,352, Cl. 141-1.000.
Corbin, Lawrence W., to Fort Wayne Wire Die, Inc. Wire elongation test method and apparatus. 4,372,154, Cl. 73-104.000.
Cordes, Rudolf: *See*—
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhart, 4,372,875, Cl. 252-413.000.
Cordoba, Julio: *See*—
Barnett, Lawrence; Cordoba, Julio; and Nuzzo, Benjamin, 4,372,419, Cl. 180-289.000.
Cork, Michael S., to Development Oil Tool Systems. Drill bit with wedge shaped eduction jets. 4,372,399, Cl. 175-65.000.
Cornelisse, Roelof, to Shell Oil Company. Process for the removal of acid gases from gas mixtures containing methane. 4,372,925, Cl. 423-226.000.
Cornell Research Foundation, Inc.: *See*—
Kuckes, Arthur F., 4,372,398, Cl. 175-45.000.
Cornell, William D.; Crouther, Ronald; Dyer, Howard P.; and Ranford, Alan B., to Sherwood Medical Industries, Inc. Chest drainage unit. 4,372,336, Cl. 137-205.000.
Corod Manufacturing Ltd.: *See*—
Kulhanek, Emanuel; and Aboussafy, John, 4,372,379, Cl. 166-68.500.
Cosentino, Cesare C.: *See*—
Hatzikelis, Christopher; Madonia, Ciro; and Cosentino, Cesare C., 4,372,083, Cl. 49-462.000.
Cosserat, Dominique: *See*—
Botton, Roger; and Cosserat, Dominique, 4,372,935, Cl. 423-393.000.
Costa, Paul. Apparatus for starting internal combustion engines. 4,372,263, Cl. 123-179.0SE.
Coste, Andre: *See*—
Chatelet, Jean; Clerc, Michel; Coste, Andre; and Rigny, Paul, 4,372,928, Cl. 423-249.000.
Coste, Jean-Claude, to Regie National des Usines Renault. Pulse-controlled electric window raiser. 4,373,149, Cl. 318-281.000.
Coucoulas, Alexander; and Nis, John R., to Western Electric Company, Inc. Methods and apparatus for extruding articles. 4,372,771, Cl. 65-75.000.
Coulter Systems Corp.: *See*—
Weber, Harold J., 4,372,679, Cl. 355-70.000.
Cousse, Henri: *See*—
Mouzin, Gilbert; Cousse, Henri; Stenger, Antoine; and Casadio, Sylvano, 4,372,975, Cl. 424-324.000.
Cox, Johnny C. Method and apparatus for removing metal from a metal-laden solution. 4,372,829, Cl. 204-109.000.
Crawley, Harry D., to Versatile Cornat Corporation. Rotary switch valve. 4,372,341, Cl. 137-580.000.
Crepin, Roger, to Thomson-Brandt. Process and apparatus for transporting and dropping a plurality of charges contained in a single container and container equipped with such an apparatus. 4,372,215, Cl. 102-387.000.
Cronk, David; and Byrum, Lyle M. Landing gear for ultralight aircraft. 4,372,506, Cl. 244-100.00R.
Cross, Raymond P.; and Simpkin, Gordon T., to Pilkington Brothers Limited. Thermal treatment of glass. 4,372,774, Cl. 65-114.000.
Crout, Richard J.: *See*—
Gilbertson, John R.; and Crout, Richard J., 4,372,978, Cl. 424-343.000.
Crouther, Ronald: *See*—
Cornell, William D.; Crouther, Ronald; Dyer, Howard P.; and Ranford, Alan B., 4,372,336, Cl. 137-205.000.
Crown Zellerbach Corporation: *See*—
Newkirk, David D.; and Wilhoit, Darrel L., 4,372,815, Cl. 162-158.000.
Cseh, Gyorgy: *See*—
Ambrus, Gabor; Toth-Sarudy, Eva; Cseh, Gyorgy; Barta, Istvan; and Horvath, Gyula, 4,372,973, Cl. 424-305.000.
CTS Corporation: *See*—
Affolder, Steven L., 4,372,903, Cl. 264-109.000.
Cubbison, Richard James, Jr., to Bell Telephone Laboratories, Incorporated. Battery feed circuit. 4,373,118, Cl. 179-77.000.
Culpin, Barry: *See*—
Peters, Kenneth; and Culpin, Barry, 4,373,015, Cl. 429-57.000.
Curtis, Ralston: *See*—
Papanu, Steven C.; and Curtis, Ralston, 4,372,943, Cl. 424-78.000.
Cuscurida, Michael: *See*—
Speranza, George P.; Cuscurida, Michael; and Zimmerman, Robert L., 4,373,034, Cl. 521-177.000.
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; PanCanadian Petroleum Limited; Esso

Resources Canada Ltd.; Canada-Cities Service, Ltd.; Gulf Canada Limited; Alberta Energy Company Ltd.; Hudson's Bay Oil and Gas Company Limited; and Petrofina Canada Inc. Method and apparatus for sampling a core of tar sand. 4,372,174, Cl. 73-863.110.

Czok, Helmut: *See*—
Simonis, Jurgen; and Czok, Helmut, 4,372,104, Cl. 56-341.000.

D. Swarovski & Co.: *See*—
Ganner, Peter; and Wallner, Theodor, 4,372,987, Cl. 427-42.000.

Daenen, Robert H. C. M.; and Herlow, Erik, to Dart Industries, Inc. Ice cube making apparatus and serving system. 4,372,526, Cl. 249-119.000.

Daicel Chemical Industries Ltd.: *See*—
Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Tuneyoshi; Takashima, Koichi; and Kato, Yasuhiko, 4,372,846, Cl. 210-86.000.

Daimon, Hiroshi: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.

Dairy Farm Leasing Company: *See*—
Keith, Alfred H., 4,372,251, Cl. 119-16.000.

Dakota Manufacturing Co., Inc.: *See*—
Fredrickson, Ronald G.; and Bills, Joseph W., Jr., 4,372,727, Cl. 414-537.000.

Dallaire, Michel J., to Bic Corporation. Car rack. 4,372,470, Cl. 224-324.000.

Dalton, Robert E. Process for securing layers of material to surfaces. 4,372,798, Cl. 156-273.100.

Danfoss A/S: *See*—
Petersen, Hans C.; Kyster, Erik; Thomsen, Svend E.; and Flagstad, Carl O., 4,372,413, Cl. 180-152.000.

Dangel, Henry L. A., to Dangel, Henry Leon Albert. Front set of wheels for an automobile vehicle. 4,372,418, Cl. 180-256.000.

Dangel, Henry Leon Albert: *See*—
Dangel, Henry L. A., 4,372,418, Cl. 180-256.000.

Danguillier, Wilhelm: *See*—
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.

Danieli & C. Officine Meccaniche S.p.A.: *See*—
Sechi, Lucio, 4,372,220, Cl. 105-215.00C.

Daniels, Lowell W.: *See*—
Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,372,980, Cl. 426-231.000.

Dante, James G., to United States of America, Army. Thermoelectric power supply for warheads. 4,372,211, Cl. 102-207.000.

Darnanville, Jean P.: *See*—
Germaine, Gilbert R.; and Darnanville, Jean P., 4,372,879, Cl. 252-470.000.

Dart Industries, Inc.: *See*—
Daenen, Robert H. C. M.; and Herlow, Erik, 4,372,526, Cl. 249-119.000.

Dartmouth College, Trustees of: *See*—
Thomae, Irving H., 4,372,692, Cl. 374-104.000.

Dassler, Karl O.; and Langseder, Neal E., to American Can Company. Retained ring tab. 4,372,462, Cl. 220-269.000.

Datasaab AB: *See*—
Stiernspetz, Allan, 4,372,549, Cl. 271-23.000.

David, Alain: *See*—
Berneman, Armand; David, Alain; Horaud, Florian; and Segard, Emile, 4,373,027, Cl. 435-240.000.

Davidson, Donald R.: *See*—
Totino, Peter J.; and Davidson, Donald R., 4,372,237, Cl. 112-308.000.

Davies, David R.; Richardson, Edwin A.; and Van Zanten, Marinus, to Shell Oil Company. Method of pretreating an underground formation for silicon polyhalide consolidation. 4,372,385, Cl. 166-281.000.

Davies, John S.; and Brooks, Gerald, to Beecham Group Limited. Clavulanic acid derivatives their preparation and use. 4,372,962, Cl. 424-272.000.

Davila, Jose E.: *See*—
Gomez, Jim H.; and Davila, Jose E., 4,372,478, Cl. 232-12.000.

Day, Alvin D.: *See*—
Villa, Paul Y.; and Day, Alvin D., 4,372,632, Cl. 312-311.000.

Day, Janet A.; and Searle, Robert J. G., to Shell Oil Company. Compounds for the loosening of fruit and/or leaves on plants. 4,372,776, Cl. 71-90.000.

De Dietrich (USA) Inc.: *See*—
Lerman, Michael J.; and Zamory, William, 4,372,461, Cl. 220-260.000.

Deak, Gedeon I., to Du Pont de Nemours, E. I., and Company. Process for converting cellulose directly into alkali cellulose. 4,373,098, Cl. 536-101.000.

de Buda, Eric G.; Boon, John R.; and Dolbey, Michael P. Pneumatically operated pipe crawler. 4,372,161, Cl. 73-432.00R.

Dec International, Inc.: *See*—
Hazen, Gretz L., 4,372,983, Cl. 426-582.000.

De Coene, Frans J. G. C.; Naaktgeboren, Adrianus; and Vansteelant, Marc G., to Sperry Corporation. Automatic bale wagons. 4,372,723, Cl. 414-111.000.

Decoufle S.A.R.L.: *See*—
Legardinier, Andre, 4,372,208, Cl. 101-366.000.

Deere & Company: *See*—
Adickes, Henning, 4,372,577, Cl. 280-780.000.
Ihm, Gerald J., 4,372,573, Cl. 280-477.000.

De Forrest, William E. Protecting device for padlocks or other similar locks. 4,372,138, Cl. 70-56.000.

Dehart, Marv L.; Kloostra, M. Leon; and Straub, Harold E., to Environmental Elements Corp. Flow measuring apparatus. 4,372,170, Cl. 73-861.610.

Delalande S.A.: *See*—
Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,372,967, Cl. 424-279.000.

Delaunay, Jean; and Le Marchand, Claude, to Societe Anonyme D.B.A. Disc brake having sliding caliper. 4,372,428, Cl. 188-73.350.

Del Principe, Robert M.; and Reichert, David A., to Mattel, Inc. Electronic baseball game. 4,372,557, Cl. 273-88.000.

dei Valle, Jaime L., to Master Modular Homes, Inc. Method and apparatus for pre-casting steel reinforced concrete box-like modules. 4,372,906, Cl. 264-256.000.

Demke, Kent R.; and Dwire, Jerold D., to International Business Machines Corporation. Full page representation through dynamic mode switching. 4,373,194, Cl. 364-900.000.

Demonte, Filippo: *See*—
Bovio, Michele; and Demonte, Filippo, 4,372,694, Cl. 400-88.000.

Dempsey, Guy C. Electronic conveyor control apparatus. 4,372,439, Cl. 198-470.000.

Dengler, Robert; and Meyer, Franz J., to Siemens Aktiengesellschaft. Method for decreasing the stop distance in moving tape devices. 4,373,171, Cl. 360-71.000.

Denkewalter, Robert G.: *See*—
Preziosi, Anthony F.; Patel, Gordhanbhai N.; Denkewalter, Robert G.; and Baughman, Ray H., 4,373,032, Cl. 521-38.000.

Dennis, Charles A.: *See*—
Means, Rodney J.; Plunkett, Galen P., Jr, Galen P.; Dennis, Charles A.; and Moon, John L., 4,373,183, Cl. 364-200.000.

Dennison, Kenneth L., Jr.: *See*—
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth L., Jr., 4,372,591, Cl. 292-221.000.

Denniston, James L., to Rockwell International Corporation. Selectively actuated flight simulation system for trainer aircraft. 4,372,507, Cl. 244-113.000.

Denton, Ivor E.; and Henney, John W., to United Kingdom Atomic Energy Authority. Preparation of dense ceramics. 4,372,902, Cl. 264-65.000.

Deptolla, Udo: *See*—
Fabinski, Walter; Deptolla, Udo; and Ascherfeld, Margareta, 4,373,137, Cl. 250-343.000.

De Satnick, Allen. Tennis ball pressurizer. 4,372,095, Cl. 53-79.000.

Desjardins, Rene A., to Boeing Company, The. Six axis vibration isolation system. 4,372,431, Cl. 188-380.000.

Detroit Gasket & Mfg. Co.: *See*—
Doerfling, Ralph G., 4,372,900, Cl. 264-45.300.

Devaud, Gerard L., to Societe d'Applications des Machines Motrices. Piston and rod assembly for sliding in a cylinder. 4,372,702, Cl. 403-24.000.

Development Oil Tool Systems: *See*—
Cork, Michael S., 4,372,399, Cl. 175-65.000.

Dever, Gerald V., Jr.: *See*—
Coppola, Pasquale J.; and Dever, Gerald V., Jr., 4,372,352, Cl. 141-1.000.

Dey, Philip; Gaylard, Bernard; and Taylor, David A., to BICC Limited. Manufacture of a flexible stranded optical fiber body. 4,372,792, Cl. 156-48.000.

Diamagnetics, Inc.: *See*—
Hughes, George F., 4,372,042, Cl. 29-825.000.

Diana, Guy D., to Sterling Drug Inc. Novel aryl-aliphatic ketone and its use as an antiviral agent. 4,372,976, Cl. 424-331.000.

Di Battista, Piero: *See*—
Gratani, Francesco; Nelli, Giuseppe; Di Battista, Piero; and Cicchetti, Osvaldo, 4,373,042, Cl. 524-100.000.

Dickenson, Royston J., to General Electric Company. Turbine bypass desuperheater control system. 4,372,125, Cl. 60-660.000.

Dieck, Ronald L.; and Kostelnik, Robert J., to General Electric Company. Molded articles of improved impact resistance and compositions therefor. 4,373,067, Cl. 525-146.000.

Dieck, Ronald L.: *See*—
Cohen, Stuart C.; and Dieck, Ronald L., 4,373,047, Cl. 524-371.000.

Diehl Machines, Div. of Waltham Watch Company: *See*—
Force, Wallace B., Jr.; and Jefferson, Francis D., 4,372,355, Cl. 142-55.000.

Diehl, Robert J.; Godare, William L.; and Wells, Frederic D., to W-K-M Wellhead Systems, Inc. Packing support for mounting a well casing packing. 4,372,563, Cl. 277-117.000.

Diesel Kiki Co. Ltd.: *See*—
Hiyama, Yasuhiro; Oshizawa, Hidekazu; Okamoto, Kenji; and Kobayashi, Masayoshi, 4,372,266, Cl. 123-357.000.

DiGiacomo, Peter M.: *See*—
Parziale, Victor E.; Dines, Martin B.; and DiGiacomo, Peter M., 4,373,079, Cl. 528-9.000.

Dillon, Robert E.: *See*—
Bower, Arnold B., Jr.; and Dillon, Robert E., 4,372,708, Cl. 405-261.000.

Dilot, Rolf M.; and Hakansson, Jan T., to Tetra Pak International AB. Method for the application of suction tubes to packing containers. 4,372,797, Cl. 156-249.000.

Dimetrics, Inc.: *See*—
Taff, James T., 4,372,474, Cl. 228-29.000.

Dimitraki, Lolita S.: *See—*
Dimitraki, Sergei N.; and Dimitraki, Lolita S., 4,372,497, Cl. 242-7.030.

Dimitraki, Sergei N.; and Dimitraki, Lolita S. Method of manufacturing wound items from coaxial microwire and device therefor. 4,372,497, Cl. 242-7.030.

Dineen, John J., to Mechanical Technology Incorporated. Stirling engine control mechanism and method. 4,372,116, Cl. 60-525.000.

Dines, Martin B.: *See—*
Parziale, Victor E.; Dines, Martin B.; and DiGiacomo, Peter M., 4,373,079, Cl. 528-9.000.

Diocovision Associates: *See—*
Cane, Albert; and Brown, Mitchell P., 4,372,741, Cl. 425-556.000.

Disteldorf, Josef; Hubel, Werner; Brandt, Siegfried; and Haage, Hans-Jurgen. Transparent polyamides from branched chain diamine and cycloaliphatic diamine. 4,373,088, Cl. 528-338.000.

Dixon, Kevin L.: *See—*
Seidel, Michael J.; and Dixon, Kevin L., 4,372,993, Cl. 427-193.000.

DM Systems, Inc.: *See—*
Drennan, Denis B.; Maylahn, Donald J.; and Schleicher, Thomas R., 4,372,300, Cl. 128-83.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.

Doerfling, Ralph G., to Detroit Gasket & Mfg. Co. Method of forming reinforced foam structure. 4,372,900, Cl. 264-45.300.

Doetsch, Hans-Peter: *See—*
Pohlmann, Erich; and Doetsch, Hans-Peter, 4,372,127, Cl. 62-6.000.

Doggett, Robert V., Jr.; and Ricketts, Rodney H., to United States of America, National Aeronautics and Space Administration. Aeroelastic instability stoppers for wind tunnel models. 4,372,158, Cl. 73-147.000.

Doggett, Robert V., Jr.; and Ricketts, Rodney H., to United States of America, National Aeronautics and Space Administration. Aeroelastic instability stoppers for wind tunnel models. 4,372,159, Cl. 73-147.000.

Dola, Frank P., to AMP Incorporated. Brake fluid level indicator. 4,373,155, Cl. 340-623.000.

Dolan, Francis H.; and Connor, Michael S., to General Foods Inc. Apparatus for mixing and extruding simulated meat mix for pet food. 4,372,734, Cl. 425-131.100.

Dolbey, Michael P.: *See—*
de Buda, Eric G.; Boon, John R.; and Dolbey, Michael P., 4,372,161, Cl. 73-432.00R.

Dolenc, Anton; and Visek, Tomas, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating-piston drive mechanism. 4,372,179, Cl. 74-579.00E.

Donhauser, William H. Recreational basin. 4,371,995, Cl. 4-538.000.

Donkle, Lucius B., Jr.: *See—*
Rasmussen, George E.; and Donkle, Lucius B., Jr., 4,372,451, Cl. 211-187.000.

Dorius, John. Mass flow thermal compensator. 4,372,195, Cl. 98-115.00R.

Dotts, Robert L.: *See—*
Schomburg, Calvin; and Dotts, Robert L., 4,373,003, Cl. 428-241.000.

Dover Corporation: *See—*
Weas, Tom, 4,372,353, Cl. 141-206.000.

Dow Chemical Company, The: *See—*
Porter, David L., 4,372,924, Cl. 423-179.000.

Dowding, John G.; Turner, Peter R.; and Hudson, Robert J., to Molins Limited. Cigarette weight monitoring system. 4,373,188, Cl. 364-552.000.

Drach, Edward. Multi-purpose kitchen device. 4,372,448, Cl. 211-41.000.

Drake, Eric F., to Reed Rock Bit Company. Cutting teeth for rolling cutter drill bit. 4,372,404, Cl. 175-374.000.

Drawert, Manfred: *See—*
Bolze, Manfred; and Drawert, Manfred, 4,373,085, Cl. 528-291.000.

Drennan, Denis B.; Maylahn, Donald J.; and Schleicher, Thomas R., to DM Systems, Inc. Cast wedge. 4,372,300, Cl. 128-83.000.

Dresser Industries, Inc.: *See—*
Efferson, Chester C., 4,372,338, Cl. 137-240.000.
Rosenhauch, Irwin; and Ellis, Gary D., 4,372,527, Cl. 251-1.00A.

Drysdale, William H.: *See—*
Kirkendall, Richard D.; Drysdale, William H.; Kokinakis, Louise D.; and Burns, Bruce P., 4,372,217, Cl. 102-521.000.

Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., to Burroughs Wellcome Co. Treatment with dialkoxy pyridopyrimidines. 4,372,957, Cl. 424-251.000.

Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, to Reinhard Mohn G.m.b.H. Device for producing a bundle of paper sheets. 4,372,201, Cl. 100-7.000.

Dufresne, Raymond A., to Eberts, Terry R.; Haynes, Herbert E., Jr.; and Ajeman, Matthew L., S. Battery connector. 4,372,636, Cl. 339-237.000.

Dugger, Doyle L., to Bandag Incorporated. Method and apparatus for non-destructive inspection of tires. 4,372,366, Cl. 157-13.000.

Dulcop International S.p.A.: *See—*
Fiorani, Franco, 4,372,281, Cl. 124-16.000.

Dunkl, Franz S.: *See—*
Finkelstein, Manuel; Ross, Sidney D.; and Dunkl, Franz S., 4,373,176, Cl. 361-433.000.
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,373,177, Cl. 361-433.00A.

Dunlop Limited: *See—*
Bond, Robert; and Blythe, Robert J., 4,373,069, Cl. 525-237.000.

Dunlop, Peter B., to Aristocost Designs Limited. Turntable mountings for record players. 4,373,200, Cl. 369-263.000.

Dunn, David J.: *See—*
Watson, Colin; and Dunn, David J., 4,372,245, Cl. 118-56.000.

Dunn, William H.; and Horey, Leonard L., to Singer Company, The. Electronically controlled sewing machine arranged to sew the mirror image of a pattern in the feeding direction. 4,372,232, Cl. 112-158.00E.

Du Pont de Nemours, E. I., and Company: *See—*
Deak, Gedeon I., 4,373,098, Cl. 536-101.000.
Levitt, George, 4,372,778, Cl. 71-94.000.
Richardson, Paul N., 4,373,049, Cl. 524-375.000.
Robinson, Ivan M., 4,373,084, Cl. 528-79.000.
Whitney, Joel G., 4,372,964, Cl. 424-273.00R.

Dur, Bernhard, to Metacon AG. Method and apparatus for the replacement of bottom closures of track-mounted transfer ladles. 4,372,537, Cl. 266-45.000.

Durant, Graham J.; and Miles, Peter D., to Smith Kline & French Laboratories Limited. Oxazolyl, isoxazolyl, triazolyl and thiadiazolyl alkyl bisamidines. 4,372,963, Cl. 424-272.000.

Duro Dyne Corporation: *See—*
Hinden, Milton, 4,372,627, Cl. 384-260.000.

Dwire, Jerold D.: *See—*
Demke, Kent R.; and Dwire, Jerold D., 4,373,194, Cl. 364-900.000.

Dyar, Ralph E.: *See—*
Myers, John L.; Benscoter, Richard D.; Chambers, Bruce B.; and Dyar, Ralph E., 4,373,111, Cl. 174-48.000.

Dyben, Jerry F.: *See—*
Pilat, Eugene R.; Franks, George J., Jr.; and Dyben, Jerry F., 4,372,590, Cl. 292-33.000.

Dyer, Howard P.: *See—*
Cornell, William D.; Crouther, Ronald; Dyer, Howard P.; and Ranford, Alan B., 4,372,336, Cl. 137-205.000.

Dyett, Derek H.; and Thorp, Neil, to Molins Limited. Cutting head for a cigarette filter attachment machine. 4,372,327, Cl. 131-95.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhart, 4,372,875, Cl. 252-413.000.

E-Systems, Inc.: *See—*
Mills, David A.; and Turner, Norris G., 4,373,185, Cl. 364-478.000.
Sanders, David E., 4,373,141, Cl. 307-351.000.

Eastman Kodak Company: *See—*
Fletcher, George L.; and Wadsworth, Donald H., 4,373,021, Cl. 430-374.000.
Lu, Wei C., 4,373,131, Cl. 219-216.000.

Eaton Corporation: *See—*
Borugian, Dennis A., 4,372,430, Cl. 188-329.000.
Gamundi, Reynold F., 4,372,426, Cl. 187-1.00R.
Mazur, Joseph S., 4,372,409, Cl. 180-54.00A.

Ebauches, S.A.: *See—*
Remy, Grandjean, 4,372,689, Cl. 368-155.000.

Eberts, Terry R.: *See—*
Dufresne, Raymond A., 4,372,636, Cl. 339-237.000.

Eckert, Heiner. Method for reduction of reducible groups. 4,372,893, Cl. 260-465.00E.

Eckert, Robert C.: *See—*
Phillips, Richard B.; Kempf, Arthur W.; and Eckert, Robert C., 4,372,812, Cl. 162-40.000.

Economics Laboratory Inc.: *See—*
Mahoney, Dennis F.; Kober, Alfred E.; and Risbud, Subhash H., 4,372,227, Cl. 110-342.000.
Mehus, Richard J., 4,372,345, Cl. 137-636.000.

Edahiro, Takao: *See—*
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,372,647, Cl. 350-96.330.

Edinger, Franz K.: *See—*
Svoboda, Josef; and Edinger, Franz K., 4,372,574, Cl. 280-634.000.

Edmonds, James T., Jr., to Phillips Petroleum Company. Arylene sulfide polymer preparation. 4,373,090, Cl. 528-387.000.

Edmonds, James T., Jr., to Phillips Petroleum Company. Arylene sulfide polymer purification. 4,373,091, Cl. 528-481.000.

Edwards, David T.: *See—*
Balme, Michael J.; and Edwards, David T., 4,373,154, Cl. 340-347.0DD.

Edwards, John V.: *See—*
Steer, Peter L.; and Edwards, John V., 4,372,308, Cl. 128-283.000.

EerNisse, Errol P.; and Paros, Jerome M., to Quartex, Inc. Resonator force transducer. 4,372,173, Cl. 73-862.590.

Efferson, Chester C., to Dresser Industries, Inc. High pressure valve assembly. 4,372,338, Cl. 137-240.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,100, Cl. 542-439.000.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,101, Cl. 542-440.000.

Ehlers, Joern; and Haukelt, Helmut, to British Petroleum Company Limited, The. Heat storage medium of $NaOH-H_2O-TeO_2$. 4,372,866, Cl. 252-70.000.

Ehret, Robert J.: *See—*
Stephens, Donald E.; and Ehret, Robert J., 4,372,150, Cl. 73-40.50R.

Ehrlich, Richard A., to Knostman, Gary J., Trustee of Metro Manufacturing of Texas and Metro Retailing of Texas, Inc. Knockdown furniture construction. 4,372,224, Cl. 108-159.000.

Eichlin, Harold E. Splitting axe. 4,372,360, Cl. 145-2.00R.
Eidschun, Charles D., to Micro-Plate, Inc. Plating sparger and method. 4,372,825, Cl. 204-27.000.
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, to BASF Aktiengesellschaft. Bisazo dyes containing a 2-amino-substituted thiazole radical. 4,372,885, Cl. 260-158.000.
Eisenberg, Joel H.: *See*—
Tringali, Robert D., 4,372,062, Cl. 36-120.000.
Eisenhauer, Elroy C. Panel marking construction. 4,372,050, Cl. 33-174.00G.
El-Chem Corporation: *See*—
Church, Peter K.; and Phillips, Alan G., 4,372,823, Cl. 204-2.100.
Electric Power Research Institute, Inc.: *See*—
Kulik, Conrad J.; and Lebowitz, Howard E., 4,372,838, Cl. 208-10.000.
Electricite de France (Service National): *See*—
Cachera, Pierre C., 4,372,911, Cl. 376-349.000.
Electro-Nucleonics, Inc.: *See*—
Mandle, Richard M.; and Wong, Yuan N., 4,372,745, Cl. 436-537.000.
Elert, Karl; and Westphal, John C., to Jos. Schlitz Brewing Company. Apparatus for forming a domed bottom in a can body. 4,372,143, Cl. 72-343.000.
Eli Lilly and Company: *See*—
Herrold, Anne M., 4,372,944, Cl. 424-83.000.
Eliason, Andrew: *See*—
Shapiro, Julius; and Eliason, Andrew, 4,372,315, Cl. 128-303.180.
Elliott, Robert L.; Engel, Lawrence J.; and Gardiner, J. Brooke, to Exxon Research & Engineering Co. Oil compositions containing oil-soluble, oxidatively and mechanically degraded ethylene copolymers. 4,372,863, Cl. 252-51.50A.
Ellis, Benjamin C., Jr., to Western Electric Company, Inc. Reverse oscillated lay cable. 4,372,105, Cl. 57-204.000.
Ellis, Gary D.: *See*—
Rosenhauch, Irwin; and Ellis, Gary D., 4,372,527, Cl. 251-1.00A.
Elpern, David G.; and Casey, Gary L., to Bendix Corporation, The. Single point intermittent flow fuel injection. 4,372,271, Cl. 123-445.000.
Elser, Wolfgang: *See*—
Neumann, Peter; Elser, Wolfgang; Bock, Gustav; and Kermer, Wolf-Dieter, 4,373,102, Cl. 544-143.000.
Elsley, Richard K.: *See*—
Tittmann, Bernhard R.; Ahlberg, Lloyd A.; and Elsley, Richard K., 4,372,163, Cl. 73-602.000.
Emerson Electric Co.: *See*—
Visos, Charles D.; and Ferguson, James M., 4,372,290, Cl. 126-355.000.
Emhart Industries, Inc.: *See*—
Gater, Arnold C., 4,372,594, Cl. 292-337.000.
Pomerantz, Daniel I.; and Baxter, Richard V., Jr., 4,372,054, Cl. 34-44.000.
Emmons, William D.; and Feely, Wayne E., to Rohm and Haas Company. Ambient hydrocurable coating compositions. 4,373,008, Cl. 428-413.000.
Engel, Lawrence J.: *See*—
Elliott, Robert L.; Engel, Lawrence J.; and Gardiner, J. Brooke, 4,372,863, Cl. 252-51.50A.
Engelhard Corporation: *See*—
Washabaugh, Frank J., 4,373,037, Cl. 523-155.000.
Engelstein, Shmuel: *See*—
Hoffman, Arnold; and Engelstein, Shmuel, 4,373,022, Cl. 430-434.000.
Enokimoto, Akito: *See*—
Tsuchiya, Toshio; Enokimoto, Akito; Mizushima, Sadao; and Takano, Suwaji, 4,372,602, Cl. 296-78.00R.
Enrecon, Inc.: *See*—
Tolman, Radon; and Stephens, Frank M., Jr., 4,372,755, Cl. 48-197.00R.
Enshu Limited: *See*—
Murakami, Kunio, 4,372,728, Cl. 414-590.000.
Enso-Gutzeit Osakeyhtio : *See*—
Marttinen, Toivo, 4,372,047, Cl. 30-123.300.
Envirex Inc.: *See*—
Saffran, Edward P., 4,372,895, Cl. 261-92.000.
Environmental Elements Corp.: *See*—
Dehart, Marv L.; Kloostra, M. Leon; and Straub, Harold E., 4,372,170, Cl. 73-861.610.
EOTec Corporation: *See*—
Maklad, Mokhtar S., 4,372,767, Cl. 65-3.120.
Erdweg, Josef: *See*—
Krasborn, Gottfried; Roentgen, Paul; Meier, Wilhelm; and Erdweg, Josef, 4,373,130, Cl. 219-203.000.
Ericsson, Axel B. R., to Frelena AB. Truss of lattice type. 4,372,093, Cl. 52-694.000.
Eriksson, Hans: *See*—
Aalund, Christer; Eriksson, Hans; and Tornberg, Claes, 4,373,012, Cl. 428-558.000.
Erlandsson, Kjell I., to Kelley Company Inc. Liquid waste feeding system for an incinerator. 4,372,226, Cl. 110-238.000.
Erlich, Egon. Adhesive sign and method of making. 4,372,070, Cl. 40-595.000.
Ermanco Incorporated: *See*—
Fleischauer, Fred J., 4,372,442, Cl. 198-790.000.
Ernst Leitz Wetzlar GmbH: *See*—
Lisfeld, Robert; and Bender, Reinhold, 4,372,650, Cl. 350-252.000.
Espe Fabrik Parmazeutischer Praparate GmbH: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,372,836, Cl. 204-159.230.
Espenscheid, Wilton F.: *See*—
Paul, James M.; and Espenscheid, Wilton F., 4,372,616, Cl. 299-5.000.
Essilor International (Compagnie Generale d'Optique): *See*—
Lombard, Gerard, 4,372,368, Cl. 164-332.000.
Esso Resources Canada Ltd.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Estes, Howard A., Jr.: *See*—
Grace, Phillip F.; and Estes, Howard A., Jr., 4,373,134, Cl. 235-386.000.
Etablissements EVIRA: *See*—
Pailler, Jean-Yves, 4,372,524, Cl. 249-79.000.
Ets. Destouche: *See*—
Tison, Eric; and Herve, Paul, 4,372,206, Cl. 101-228.000.
Evans Products Company: *See*—
Blout, Bennett O., 4,372,716, Cl. 410-134.000.
EVG Entwicklungs-und-Verwertungs Gesellschaft mbH: *See*—
Schmidt, Gerhard; Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, 4,372,350, Cl. 140-112.000.
Evora, Victor. Sleeve protector for venting pipes. 4,372,585, Cl. 285-43.000.
Exxon Production Research Co.: *See*—
Young, Kenneth E., 4,372,706, Cl. 405-195.000.
Exxon Research and Engineering Co.: *See*—
Bearden, Roby; and Stuntz, Gordon F., 4,372,840, Cl. 208-113.000.
Elliott, Robert L.; Engel, Lawrence J.; and Gardiner, J. Brooke, 4,372,863, Cl. 252-51.50A.
Liotta, Ronald, 4,372,750, Cl. 44-1.00R.
Miller, Harold N., 4,372,862, Cl. 252-33.000.
Stuntz, Gordon F.; and Bearden, Roby, 4,372,841, Cl. 208-113.000.
Fabinski, Walter; Deptolla, Udo; and Ascherfeld, Margareta, to Hartmann & Braun Aktiengesellschaft. Radiation detection and receiving in nondispersive infrared gas analyzer. 4,373,137, Cl. 250-343.000.
Fahim, Mostafa S. Treatment of acne and skin disorders and compositions therefor. 4,372,296, Cl. 128-24.00A.
Fahrbach, Erich: *See*—
Knoke, Jurgen; Jost, Manfred; Fahrbach, Erich; and Tecl, Bohuslav, 4,373,000, Cl. 428-198.000.
Fantuzzo, Joseph; and Till, Henry R., to Xerox Corporation. Electrophotographic printing machine. 4,372,669, Cl. 355-3.00R.
Farnhill, William M.; and Parker, Alan. Roller for friction spinning apparatus. 4,372,109, Cl. 57-401.000.
Farrant, David J. R., to Automotive Products Limited. Ball and socket joints. 4,372,621, Cl. 308-2.00R.
Faull, James K. Rocker structure for rocking chairs. 4,372,606, Cl. 297-265.000.
Favret, Uncas, Jr. Offshore platform deck drainage. 4,372,757, Cl. 55-46.000.
Fecske, Aurel J., to Alfa-Laval AB. Multiple hydrocyclone separator. 4,372,845, Cl. 209-211.000.
Feddeler, Lester H., to Coach and Car Equipment Corporation. Seat with adjustable back. 4,372,611, Cl. 297-371.000.
Feder, Alvin, to Motorola, Inc. Adjustable transducer. 4,373,119, Cl. 179-110.00A.
Federspiel, Jean M., to Commissariat a l'Energie Atomique. Shock absorber for a vehicle with a flexible suspension. 4,372,545, Cl. 267-8.00R.
Feely, Wayne E.: *See*—
Emmons, William D.; and Feely, Wayne E., 4,373,008, Cl. 428-413.000.
Feldkamper, Richard: *See*—
Achelpohl, Fritz; and Feldkamper, Richard, 4,372,436, Cl. 198-377.000.
Felsvang, Karsten S.: *See*—
Gude, Klaus E.; Felsvang, Karsten S.; and Coe, Everett L., 4,372,926, Cl. 423-244.000.
Fendler, Eleanor J.; and Bernardin, Leo J., to Kimberly-Clark Corporation. Absorbent pad including a microfibrous web. 4,372,312, Cl. 128-290.00R.
Fera, Julius J.: *See*—
Valentine, John J.; and Fera, Julius J., 4,372,144, Cl. 72-352.000.
Ferguson, Douglas J.: *See*—
Kowalski, Daniel J.; and Ferguson, Douglas J., 4,372,469, Cl. 224-321.000.
Ferguson, James M.: *See*—
Visos, Charles D.; and Ferguson, James M., 4,372,290, Cl. 126-355.000.
Ferguson, Robert M.: *See*—
Azar, Jack C.; Henry, Arnold W.; and Ferguson, Robert M., 4,372,246, Cl. 118-60.000.
Ferrando, Carlo: *See*—
Triplett, Baylor B.; Ferrando, Carlo; and Galli, Guido, 4,372,808, Cl. 156-655.000.
Ferrari, Lorenzo: *See*—
Bruzzese, Tiberio; and Ferrari, Lorenzo, 4,372,961, Cl. 424-267.000.
Fetaud, Henri: *See*—
Bocourt, Francois; and Fetaud, Henri, 4,372,541, Cl. 266-220.000.
Fette, Bruce A.; Harte, Bruce D.; and Tennyson, Bill E., to Motorola Inc. Absolute magnitude difference function generator for an LPC system. 4,373,191, Cl. 364-724.000.

Feuerstein, Diane: *See—*
Snyder, William R.; and Feuerstein, Diane, 4,372,870, Cl. 252-180.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
Loken, Arlin D.; and Luebkemann, Leroy, 4,372,410, Cl. 180-89.120.
Fields, John T.; and Lee, Cecil D. Method for ultrasonic cleaning of radiators. 4,372,787, Cl. 134-1.000.
Fink, Herbert: *See—*
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.
Fink, Raymond W., to Tool Dynamics, Inc. Auxiliary towel rack. 4,372,449, Cl. 211-86.000.
Finkelstein, Manuel; Ross, Sidney D.; and Dunkl, Franz S., to Sprague Electric Company. Electrolytic capacitor for at least 200 V service. 4,373,176, Cl. 361-433.000.
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., to Sprague Electric Company. High temperature electrolytic capacitor. 4,373,177, Cl. 361-433.00A.
Fiorani, Franco, to Dulcop International S.p.A. Spring type boomerang projecting pistol. 4,372,281, Cl. 124-16.000.
Firestone Tire & Rubber Company, The: *See—*
Gunesin, Binnur; Hamed, Gary R.; Kang, Jung W.; and Schulz, Donald N., 4,373,068, Cl. 525-218.000.
Firey, Joseph C. Char burning free piston gas generator. 4,372,256, Cl. 123-23.000.
Firmenich SA: *See—*
Ohloff, Gunther; and Giersch, Wolfgang K., 4,372,881, Cl. 252-522.00R.
Fischer, Artur. Drill tool. 4,372,401, Cl. 175-209.000.
Fischer, Hannes: *See—*
Ritz, Jurgen; Fischer, Hannes; and Plum, Helmut, 4,373,078, Cl. 526-317.000.
Fish, Irving; Schwartz, Stephen A.; and Samuels, Stanley, to New York University. Anticonvulsive compositions and method of treating convulsive disorders. 4,372,974, Cl. 424-319.000.
Fisher, Alfred J., III; and Bell, Robert L., to Fisher Corporation. Silent seat back recliner mechanism. 4,372,610, Cl. 297-367.000.
Fisher Corporation: *See—*
Fisher, Alfred J., III; and Bell, Robert L., 4,372,610, Cl. 297-367.000.
Fisher, Wayland I.; and Petersen, Marvin J., to J. R. Simplot Company. Cutting assembly. 4,372,184, Cl. 83-98.000.
Fishgal, Semyon I. Fuel-feed system. 4,372,491, Cl. 239-102.000.
Fitch, Arthur H.: *See—*
Zucker, Joseph; and Fitch, Arthur H., 4,372,768, Cl. 65-4.210.
Fixel, Irving E. Abduction pillow with storage cavity. 4,372,299, Cl. 128-80.00A.
Flagstad, Carl O.: *See—*
Petersen, Hans C.; Kyster, Erik; Thomsen, Svend E.; and Flagstad, Carl O., 4,372,413, Cl. 180-152.000.
Flaherty, John J.: *See—*
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,372,658, Cl. 354-63.000.
Flamm, Daniel L.: *See—*
Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., 4,372,834, Cl. 204-157.10R.
Flanagan, Margaret M.: *See—*
Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.
Fleischauer, Fred J., to Ermanco Incorporated. Torque-transmitting drive. 4,372,442, Cl. 198-790.000.
Fleissner, Hans. Apparatus and process for packaging synthetic fibers in bales. 4,372,101, Cl. 53-435.000.
Fleming, Daniel J.: *See—*
Bergeron, D. L.; Fleming, Daniel J.; and Stephens, Geoffrey B., 4,373,166, Cl. 357-15.000.
Flemings, Merton C.; and Matsuniya, Tooru, to Massachusetts Institute of Technology. Continuous process for forming sheet metal from an alloy containing non-dendritic primary solid. 4,372,369, Cl. 164-482.000.
Fletcher, George L.; and Wadsworth, Donald H., to Eastman Kodak Company. Indolizinone dyes and compositions, elements and methods using same. 4,373,021, Cl. 430-374.000.
Flower, Wallace C., to Lord Corporation. Truck cab tilt mechanism. 4,372,411, Cl. 180-89.150.
Flutec Fluidtechnische Gerate GmbH: *See—*
Klauck, Manfred, 4,372,849, Cl. 210-167.000.
Focia, Michael, Jr.: *See—*
Clark, Keith R.; and Focia, Michael, Jr., 4,372,028, Cl. 29-460.000.
Fogg, O. Douglas: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,373,193, Cl. 364-900.000.
Fogle, Harold W. Method of treating diseased organ. 4,372,305, Cl. 128-214.00B.
Fohl, Artur, to REPA Feinstanzwerk GmbH. Belt adjusting device for a safety belt. 4,372,012, Cl. 24-68.00R.
Fonda-Bonardi, Giusto. Fluid flow control system. 4,372,731, Cl. 415-166.000.
Force, Wallace B., Jr.; and Jefferson, Francis D., to Diehl Machines, Div. of Waltham Watch Company. Wood turning lathe apparatus. 4,372,355, Cl. 142-55.000.
Ford, Harry S., Jr.; and Hamparian, Nshan, to General Motors Corporation. V-Type engine intake with vibration isolated manifold connector. 4,372,120, Cl. 60-605.000.
Ford Motor Company: *See—*
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,372,112, Cl. 60-323.000.
Bomback, John L., 4,372,748, Cl. 436-73.000.
Butler, James W.; Colvin, Alex D.; and Schuetzle, Dennis, 4,372,155, Cl. 73-114.000.
Kaniut, Herbert, 4,372,262, Cl. 123-179.00J.
McCarthy, Shaun L.; and Lambe, John J., 4,373,145, Cl. 313-503.000.
Forgione, Joseph. Heat releasable window guard. 4,372,081, Cl. 49-8.000.
Formax, Inc.: *See—*
Sandberg, Glenn A., 4,372,008, Cl. 17-32.000.
Forsheda Gummifabrik AB: *See—*
Bolsman, Nils-Erik, 4,372,905, Cl. 264-249.000.
Fort Wayne Wire Die, Inc.: *See—*
Corbin, Lawrence W., 4,372,154, Cl. 73-104.000.
Fortier, Jacques. Rotating wedge for blocking up the dumping platform of a truck in dumping position. 4,372,614, Cl. 298-17.00B.
Fosdick, Dale P.: *See—*
Rosaen, Borje O.; and Fosdick, Dale P., 4,372,855, Cl. 210-316.000.
Fossi, Paolo; and Sambarino, Emilio. Process for the recovery of indium. 4,372,922, Cl. 423-112.000.
Four Star Corporation: *See—*
Kowalski, Daniel J.; and Ferguson, Douglas J., 4,372,469, Cl. 224-321.000.
Fowler, Gary P. Palm guard. 4,371,984, Cl. 2-20.000.
Fowler, George B., to Humanicare International Inc. Moisture absorbent pad. 4,372,309, Cl. 128-284.000.
Foxboro Company, The: *See—*
Brown, Christopher R.; and Olsen, Everett O., 4,372,164, Cl. 73-704.000.
Frame, Norman J., to W. H. Brady Co. Capacitance switch. 4,373,122, Cl. 200-159.00B.
Frame, Norman J., to W. H. Brady Co. Capacitance switch. 4,373,124, Cl. 200-159.00B.
Frank J. Zamboni & Co.: *See—*
Zamboni, Frank J., 4,372,617, Cl. 299-24.000.
Franke, Kurt, to Siemens Aktiengesellschaft. Cathode arrangement for an X-ray tube. 4,373,144, Cl. 313-338.000.
Franks, George J., Jr.: *See—*
Pilat, Eugene R.; Franks, George J., Jr.; and Dyben, Jerry F., 4,372,590, Cl. 292-33.000.
Franse, Albert D.: *See—*
Watson, Frederick D.; Mayse, Weldon D.; and Franse, Albert D., 4,372,837, Cl. 204-186.000.
Franz Plasser Bahnbaumaschinen Industriellgesellschaft m.b.H.: *See—*
Theurer, Josef, 4,372,714, Cl. 409-293.000.
Franzkoch, Bernd: *See—*
Menges, George; Kircher, Klaus; and Franzkoch, Bernd, 4,372,898, Cl. 264-22.000.
Fredrickson, Ronald G.; and Bills, Joseph W., Jr., to Dakota Manufacturing Co., Inc. Trailer including a multiple fold powered ramp tail. 4,372,727, Cl. 414-537.000.
Frelena AB: *See—*
Ericsson, Axel B. R., 4,372,093, Cl. 52-694.000.
Friederich, Ernst: *See—*
Vetter, Heinz; and Friederich, Ernst, 4,372,739, Cl. 425-466.000.
Frisch, Georg D.; and Ward, William, Jr., to United States of America, Navy. Dynamic kickplate deployment system. 4,372,508, Cl. 244-122.0AG.
Fritze, Gary D.; and Graham, Joseph, to Minnesota Mining and Manufacturing Company. Heat- and flame-resistant sheet material. 4,372,997, Cl. 428-144.000.
Froelich, Jerry W.: *See—*
Strauss, Harry W.; Callahan, Ronald J.; and Froelich, Jerry W., 4,372,294, Cl. 128-1.100.
Fruehauf Corporation: *See—*
Stanczak, Edmund A.; and Ringe, Stephen J., 4,372,603, Cl. 296-146.000.
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Process for the preparation of 1-aminobenzene-5-β-sulfatoethylsulfone-2,4-disulfonic acid, the 5-vinylsulfone compound and the alkali salts thereof. 4,372,892, Cl. 260-458.00C.
Fuhri, William F. Portable easel device. 4,372,630, Cl. 312-231.000.
Fuini, Dennis L.: *See—*
Newton, Charles L.; and Fuini, Dennis L., 4,372,124, Cl. 60-648.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Takizawa, Junichi; Kojima, Seiichiro; Satoh, Nobuo; and Nakazato, Eiji, 4,372,578, Cl. 280-802.000.
Fuji Photo Film Co., Ltd.: *See—*
Hara, Yoshio; and Shibata, Tadayoshi, 4,372,660, Cl. 354-180.000.
Fujii, Masahiko: *See—*
Yoshikumi, Chikao; Fujii, Takayoshi; Saito, Kenichi; Fujii, Masahiko; and Niimura, Koichi, 4,372,890, Cl. 260-429.00R.
Fujii, Takayoshi: *See—*
Yoshikumi, Chikao; Fujii, Takayoshi; Saito, Kenichi; Fujii, Masahiko; and Niimura, Koichi, 4,372,890, Cl. 260-429.00R.
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.

Fujii, Takayuki; and Suda, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle instrument panel attaching structure. 4,372,412, Cl. 180-90.000.

Fujikura, Takashi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,373,106, Cl. 564-85.000.

Fujioka, Futoshi: *See*—
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,373,108, Cl. 568-817.000.

Fujioka, Yoshisato; and Kawamura, Atsushi, to Ricoh Company, Ltd. Telephoto zoom lens. 4,372,654, Cl. 350-427.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,372,952, Cl. 424-246.000.

Fujita, Isao: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.

Fujita, Yutaka: *See*—
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.

Fujitsu Limited: *See*—
Hanabusa, Takayoshi; Yamamoto, Kenji; Umemoto, Shinzi; Kurosawa, Keiji; and Yamashita, Mitsuo, 4,372,804, Cl. 156-631.000.
Isogai, Hideaki; and Tanaka, Miki, 4,373,196, Cl. 365-189.000.
Katsumata, Yutaka, 4,373,179, Cl. 364-200.000.
Toyoda, Kazuhiro; Ono, Chikai; and Hayashi, Toshio, 4,373,195, Cl. 365-154.000.
Watanabe, Yutaka; and Matsuo, Hisayasu, 4,373,019, Cl. 430-317.000.

Fulton, Theodore A.; and Hebard, Arthur F., to Bell Telephone Laboratories, Incorporated. Hybrid unlatching flip-flop logic element. 4,373,138, Cl. 307-277.000.

Funke, Craig D. Flue box assembly. 4,372,289, Cl. 126-292.000.

Furukawa, Junji; Furuno, Nobuo; Matsumura, Akira; and Kuwajima, Teruaki, to Nippon Paint Co., Ltd. Acetylene-conjugated diene polymerization. 4,373,074, Cl. 526-92.000.

Furuno, Nobuo: *See*—
Furukawa, Junji; Furuno, Nobuo; Matsumura, Akira; and Kuwajima, Teruaki, 4,373,074, Cl. 526-92.000.

Fushiki, Yasuo: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.

G. D. Societa' per Azioni: *See*—
Serganoli, Enzo, 4,372,326, Cl. 131-84.00B.

Gabbay, Kenneth; and Gallop, Paul M., to Children's Hospital Medical Center. Glycohemoglobin determination. 4,372,747, Cl. 436-67.000.

Galasso, Francis S.; and Veltri, Richard D., to United Technologies Corporation. Silicon carbide coated carbon fibers and composites. 4,373,006, Cl. 428-368.000.

Galindez, Luis, to Vidrierias de Llodio, S.A. Glass cutting system. 4,372,471, Cl. 225-1.000.

Galli, Guido: *See*—
Triplett, Baylor B.; Ferrando, Carlo; and Galli, Guido, 4,372,808, Cl. 156-655.000.

Galliher, Parrish M.: *See*—
Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.

Gallop, Paul M.: *See*—
Gabbay, Kenneth; and Gallop, Paul M., 4,372,747, Cl. 436-67.000.

Galloway, Scott M.: *See*—
Harned, Frederich C.; and Galloway, Scott M., 4,372,476, Cl. 229-16.00A.

Gambro AB: *See*—
Larsson, Lars-Ake L.; Gullberg, Claes-Ake; Stenberg, Kaj; and Boberg, Nils G. E., 4,372,484, Cl. 494-14.000.

Gamundi, Reynold F., to Eaton Corporation. Mast structure. 4,372,426, Cl. 187-1.00R.

Ganguly, Ashit K.; Sarre, Olga; and Liu, Yi-Tsung, to Schering Corporation. Macrolide antibacterial AR-5 components. 4,373,095, Cl. 536-7.100.

Ganner, Peter; and Wallner, Theodor, to D. Swarovski & Co. Method of producing a multilayer anti-reflection coating. 4,372,987, Cl. 427-42.000.

Garcia, Alexander: *See*—
LaViolette, Paul A.; Caccioli, Anthony; Garcia, Alexander; Hotchkiss, Earl H.; and Marchitto, Alfred J., Jr., 4,372,016, Cl. 24-241.0PS.

Garcia, Francisco E., to Patentes FAC, S.A. Lock. 4,372,137, Cl. 70-41.000.

Gardiner, J. Brooke: *See*—
Elliott, Robert L.; Engel, Lawrence J.; and Gardiner, J. Brooke, 4,372,863, Cl. 252-51.50A.

Gardiner, Philip M. Cupel. 4,372,543, Cl. 266-275.000.

Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrocracking, hydrodesulfurization, and/or hydrodenitrogenation of organic compounds employing promoted zinc titanate and a zeolite as the catalytic agent. 4,372,842, Cl. 208-254.00H.

Garner, Billy J.: *See*—
Bobst, Robert W.; Garner, Billy J.; and Jacob, Frederick W., 4,372,758, Cl. 55-48.000.

Gaschler, Erich: *See*—
Hofbauer, Peter; Gaschler, Erich; and Schwarz, Cornelia, 4,372,257, Cl. 123-68.000.

Gassaway, Gary S.; Scott, William R.; and Runge, Richard J., to Chevron Research Company. Exploration system for enhancing the likelihood of predicting lithology of earth formations associated with deposits of ore, marker rock and/or economic minerals. 4,373,197, Cl. 367-36.000.

Gater, Arnold C., to Emhart Industries, Inc. Bayonet joint backset adjustment for latch constructions. 4,372,594, Cl. 292-337.000.

Gautier, Charlie V., Jr. Grommet. 4,372,013, Cl. 24-144.000.

Gauvain, Roger, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Apparatus for the automatic infeed of a textile fibre sheet into a coiler. 4,372,010, Cl. 19-159.00R.

Gavenonis, Thomas L.: *See*—
Shaffer, John W.; and Gavenonis, Thomas L., 4,372,210, Cl. 102-204.000.

Gaylard, Bernard: *See*—
Dey, Philip; Gaylard, Bernard; and Taylor, David A., 4,372,792, Cl. 156-48.000.

Gebruder Welger GmbH & Co. Kommanditgesellschaft: *See*—
Simonis, Jurgen; and Czok, Helmut, 4,372,104, Cl. 56-341.000.

Geisler, Thomas C., to Minnesota Mining and Manufacturing Company. Stabilizer for electron doner-acceptor carbonless copying systems. 4,372,582, Cl. 282-27.500.

Gelfer, Vadim: *See*—
Kaganovsy, Yaacov; Kustanovich, Yosef; Shmuter, Shimshon; Gelfer, Vadim; and Muchnik, Shimon, 4,372,818, Cl. 202-83.000.

General Clutch Corp.: *See*—
Waine, Martin; and Nisenson, Jules, 4,372,432, Cl. 192-8.00C.

General Dynamics Corporation/Convair Div.: *See*—
Bartholomew, Bruce J., 4,372,684, Cl. 356-348.000.

General Dynamics, Pomona Division: *See*—
Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.

General Electric Company: *See*—
Abolins, Visvaldis; and Luxon, Bruce A., 4,373,052, Cl. 524-451.000.
Allen, Richard B., 4,373,040, Cl. 523-466.000.
Armijo, Joseph S.; and Coffin, Louis F., Jr., 4,372,817, Cl. 376-417.000.
Bennett, James G., Jr.; and Lee, Gim F., Jr., 4,373,064, Cl. 525-68.000.
Bower, Arnold B., Jr.; and Dillon, Robert E., 4,372,708, Cl. 405-261.000.
Bradley, Irving; and Vodicka, Vincent, 4,372,794, Cl. 156-73.100.
Ching, Ta-Yen, 4,373,060, Cl. 524-767.000.
Ching, Ta-Yen, 4,373,061, Cl. 524-767.000.
Chung, Rack H.; and Kray, William D., 4,372,835, Cl. 204-159.130.
Cohen, Stuart C.; and Dieck, Ronald L., 4,373,047, Cl. 524-371.000.
Cooper, Glenn D.; and Lee, Gim F., Jr., 4,373,045, Cl. 524-141.000.
Dickenson, Royston J., 4,372,125, Cl. 60-660.000.
Dieck, Ronald L.; and Kostelnik, Robert J., 4,373,067, Cl. 525-146.000.
Haaf, William R.; Katchman, Arthur; and Lee, Gim F., Jr., 4,373,055, Cl. 524-505.000.
Jackson, Joseph J., 4,372,789, Cl. 148-3.000.
Morton, James W., 4,372,029, Cl. 29-564.400.
Ritter, Allen M., 4,373,150, Cl. 318-336.000.
Stillman, Gordon B.; and White, Charles R., 4,372,597, Cl. 294-67.0DA.
Sugalski, Raymond K.; Leduc, Kenneth C.; and Morris, Jesse L., 4,373,129, Cl. 219-79.000.

General Foods Inc.: *See*—
Dolan, Francis H.; and Connor, Michael S., 4,372,734, Cl. 425-131.100.

General Motors Corporation: *See*—
Caruthers, John E.; Jay, Robert L.; Riffel, Ronald E.; and Rothrock, Mark D., 4,372,157, Cl. 73-147.000.
Ford, Harry S., Jr.; and Hamparian, Nahan, 4,372,120, Cl. 60-605.000.
Hyma, Marvin J., 4,372,575, Cl. 280-661.000.
Zaydel, Wieslaw S., 4,372,718, Cl. 411-366.000.

General Railway Signal Company: *See*—
Gomez, Jim H.; and Davila, Jose E., 4,372,478, Cl. 232-12.000.

General Signal Corporation: *See*—
Carlson, William L., Jr., 4,373,147, Cl. 318-48.000.

Genese, Joseph N.; and Muetterties, Andrew J., to Abbott Laboratories. Equipment sets having a combined air barrier and liquid sequencing device for the sequential administration of medical liquids at dual flow rates. 4,372,306, Cl. 128-214.00G.

Gennari, Federico: *See*—
Stramentinoli, Giorgio; and Gennari, Federico, 4,373,097, Cl. 536-26.000.

GEO Vann, Inc.: *See*—
Kinney, Charles W., 4,372,384, Cl. 166-278.000.

Germaine, Gilbert R.; and Darnanville, Jean P., to Shell Oil Company. Li-spinel catalyst for non-oxidative dehydrogenation process. 4,372,879, Cl. 252-470.000.

Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, to Dr. C. Otto & Comp. G.m.b.H.; and Saarbergwerke Aktiengesellschaft, a part interest. Ignition system for coal gasifier. 4,372,754, Cl. 48-77.000.

Ghelardoni, Mario: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., 4,372,958, Cl. 424-253.000.
Gisimo, Anthony: *See*—
Larsen, Robert H.; and Gisimo, Anthony, 4,372,502, Cl. 242-149.000.
Giannotti, Danilo: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., 4,372,958, Cl. 424-253.000.
Gibbs, James W., to Gibbs-Ryder Materials Handling Systems, Inc. Material handling system. 4,372,219, Cl. 104-165.000.
Gibbs-Ryder Materials Handling Systems, Inc.: *See*—
Gibbs, James W., 4,372,219, Cl. 104-165.000.
Gibson, David V.; McKay, Garry M.; and Swalwell, John E. Dispersion process and product. 4,373,054, Cl. 524-460.000.
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., to Bell Telephone Laboratories, Incorporated. Apparatus for adjusting cable tension. 4,372,535, Cl. 254-319.000.
Giersch, Wolfgang K.: *See*—
Ohloff, Gunther; and Giersch, Wolfgang K., 4,372,881, Cl. 252-522.00R.
Gigante, Joseph R., to United States of America, Navy. Method for etch thinning silicon devices. 4,372,803, Cl. 156-626.000.
Gilbertson, John R.; and Crout, Richard J., to University of Pittsburgh. Antibacterial agent and method. 4,372,978, Cl. 424-343.000.
Gilders, Ross D.: *See*—
Salter, Robert S.; Boorman, Roy S.; and Gilders, Ross D., 4,372,782, Cl. 75-118.00R.
Gillbrand, Per S.; Axelson, Simon E.; and Jiewertz, Sten R., to Saab-Scania Aktiebolag. Method of avoiding abnormal combination in an internal combination engine and an arrangement for carrying out the method. 4,372,119, Cl. 60-600.000.
Gilomen, Beat: *See*—
Uebelhart, Walter; Gilomen, Beat; and Parel, Claude, 4,372,108, Cl. 57-358.000.
Giordano, Anthony P.; and Mauer, Michael G., Jr. Conduit bending apparatus. 4,372,145, Cl. 72-387.000.
Globe Machine Manufacturing Company: *See*—
Steiling, Vigil, 4,372,357, Cl. 144-114.00R.
Glore, Thomas G., to Singer Company, The. Jointer-planer in-feed table. 4,372,358, Cl. 144-117.00R.
Glumac, Nick P. Mobile storage platform. 4,372,514, Cl. 248-163.00R.
Goans, Kip B., to Baker CAC, Inc. Valve actuating apparatus and method. 4,372,333, Cl. 137-1.000.
Gobel, Armin: *See*—
Patzschke, Hans-Peter; and Gobel, Armin, 4,373,059, Cl. 524-761.000.
Patzschke, Hans-Peter; and Gobel, Armin, 4,373,072, Cl. 525-438.000.
Godare, William L.: *See*—
Diehl, Robert J.; Godare, William L.; and Wells, Frederic D., 4,372,563, Cl. 277-117.000.
Goden, Kiyoshi: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.
Godfrey, Andrew A.: *See*—
Hadler, Malcolm R.; Woodward, David R.; and Godfrey, Andrew A., 4,372,970, Cl. 424-282.000.
Goebel, Franz, to GTE Products Corporation. Method for assembling an electrochemical cell. 4,372,038, Cl. 29-623.200.
Goertzen, Gerold G.; and Herscher, Lee R., to Roper Corporation. Garden tiller with extended tine shield. 4,372,397, Cl. 172-42.000.
Goforth, Melvin L.; and Russell, Richard G. Electronic assembly process and apparatus. 4,372,475, Cl. 228-170.000.
Gogniat, Guy; and Grobois, Jacques, to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.). Spherical indicators for aircraft. 4,372,160, Cl. 73-178.00R.
Gohring, Werner; and Luiten, Cornelius H., to Ipsen Industries International GmbH. Method and apparatus for the control of the carbon level of a gas mixture reacting in a furnace chamber. 4,372,790, Cl. 148-16.500.
Goldman, Alex: *See*—
Yu, Bu-Fan B.; and Goldman, Alex, 4,372,865, Cl. 252-62.620.
Goldman, Sidney M. Fishing tackle storage apparatus. 4,372,073, Cl. 43-57.100.
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, to Kozponti Banyaszati Fejlesztesi Intezet. Process for measuring the tightness of endless driving means during operation. 4,372,172, Cl. 73-862.390.
Gomez, Jim H.; and Davila, Jose E., to General Railway Signal Company. Fare collection system and components thereof. 4,372,478, Cl. 232-12.000.
Gooch, Kendrick J.; Scharer, Hans R.; and Winter, William, to USM Corporation. Adjustable roller head extrusion die. 4,372,736, Cl. 425-149.000.
Good Earth Growers, Inc.: *See*—
Moore, Michael J.; and Studley, Charles F., Jr., 4,372,725, Cl. 414-460.000.
Goodall, Maurice, to Maurice Goodall (Holdings) Limited. Spray-inhibiting means for use on a road vehicle. 4,372,570, Cl. 280-154.50R.
Goodwin, John D., to Inventure, Inc. Insulation material. 4,373,005, Cl. 428-357.000.
Goodyear Aerospace Corporation: *See*—
Knaus, Ernest; Liggett, Paul E.; and Namsick, Raymond J., 4,372,533, Cl. 254-93.0HP.
Goodyear Tire & Rubber Company, The: *See*—
Kimball, Michael E.; and Randleman, Marvin T., 4,373,082, Cl. 528-60.000.
Gordon, Norman E.: *See*—
Sewell, James D.; and Gordon, Norman E., 4,372,717, Cl. 410-154.000.
Goring, Joachim E., to Beecham-Wulfing GmbH & Co. KG. 1-(5-Oxohexyl)-3-alkyl-7-(2-oxopropyl)xanthines. 4,372,959, Cl. 424-253.000.
Gorjunov, Georgy L.: *See*—
Surovikin, Vitaly F.; Rogov, Alexandr R.; Sazhin, Gennady V.; and Gorjunov, Georgy L., 4,372,936, Cl. 423-450.000.
Goto, Masana: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
Gott Corporation: *See*—
Branscum, Tony E., 4,372,453, Cl. 215-13.00R.
Goudsche Machinefabriek B.V.: *See*—
Mann, Adriaan B., 4,372,153, Cl. 73-84.000.
Gould Inc.: *See*—
Halasz, Laszlo, 4,372,773, Cl. 65-108.000.
Gowin-Card, Inc.: *See*—
Maier, H. Armin, 4,372,001, Cl. 8-151.000.
Grab, Fred W.: *See*—
Pfannkuch, Robert B.; and Grab, Fred W., 4,373,156, Cl. 340-703.000.
Grace, Phillip F.; and Estes, Howard A., Jr. Magnetic card vote casting system. 4,373,134, Cl. 235-386.000.
Grafius, Gerald: *See*—
Notarione, Patrick D.; Turk, Ronald K.; and Grafius, Gerald, 4,372,463, Cl. 221-10.000.
Graham, Joseph: *See*—
Fritze, Gary D.; and Graham, Joseph, 4,372,997, Cl. 428-144.000.
Grain Processing Corporation: *See*—
Hubbard, E. Daniel; and Harvey, Richard D., 4,373,099, Cl. 536-105.000.
Grams, Wolfgang: *See*—
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.
Granges Nyby AB: *See*—
Aslund, Christer; Eriksson, Hans; and Tornberg, Claes, 4,373,012, Cl. 428-558.000.
Gratani, Francesco; Nelli, Giuseppe; Di Battista, Piero; and Cicchetti, Osvaldo, to Montedison S.p.A. N,N-Di-(hydroxy-phenyl) derivatives of piperazine and use thereof as stabilizers for polymers. 4,373,042, Cl. 524-100.000.
Graviner Limited: *See*—
Ball, David N., 4,373,136, Cl. 250-339.000.
Greci, John J.: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,372,801, Cl. 156-434.000.
Greenley, Gordon A.: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, P. Duncan, 4,373,193, Cl. 364-900.000.
Greenville Steel Textile Machinery Corporation: *See*—
Heidan, Klaus, 4,372,135, Cl. 68-22.00R.
Greten, Berndt: *See*—
Wiemann, Dieter; Seeger, Gunter; and Greten, Berndt, 4,372,899, Cl. 264-25.000.
Greuel, Walter J., Jr., to Raychem Corporation. Method and apparatus for wrapping a tape around a pipe. 4,372,796, Cl. 156-187.000.
Grewal, Virinder; and Reindl, Werner, to Siemens Aktiengesellschaft. Method for manufacturing solderable, temperable, thin film tracks which do not contain precious metal. 4,372,809, Cl. 156-656.000.
Grieger, Robert G.: *See*—
Scapple, Robert Y.; Keister, Frank Z.; Grieger, Robert G.; and Himmel, Richard P., 4,372,037, Cl. 29-613.000.
Griffith, Oliver C. Identification device. 4,372,069, Cl. 40-490.000.
Grobois, Jacques: *See*—
Gogniat, Guy; and Grobois, Jacques, 4,372,160, Cl. 73-178.00R.
Grosse, Klaus: *See*—
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.
Grossmann, Frederic; and Sinn, Larry A., to American Hospital Supply Corporation. Bandage frame and method. 4,372,303, Cl. 128-132.00D.
Grove, William C.: *See*—
Welch, Joseph J.; Grove, William C.; and Moran, Michael E., 4,372,517, Cl. 248-267.000.
Gruenenthal GmbH: *See*—
Seipp, Ulrich; Vollenberg, Werner; Mueller, Bernd; and Michel, Gudrun, 4,372,971, Cl. 424-285.000.
Grumman Aerospace Corporation: *See*—
Chin, Sze L., 4,373,140, Cl. 307-351.000.
GTE Automatic Electric Laboratories, Inc.: *See*—
Zucker, Joseph; and Fitch, Arthur H., 4,372,768, Cl. 65-4.210.
GTE Products Corporation: *See*—
Bonazoli, Robert P.; and Paget, Fredrick W., 4,373,146, Cl. 315-209.00R.
Goebel, Franz, 4,372,038, Cl. 29-623.200.
Shaffer, John W.; and Gavenonis, Thomas L., 4,372,210, Cl. 102-204.000.

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Gude, Klaus E.; Felsvang, Karsten S.; and Coe, Everett L., to A/S Niro Atomizer; and Joy Manufacturing Company. Process for desulfurization, dedusting and discharge of hot fly ash-containing flue gas. 4,372,926, Cl. 423-244.000.

Guditz, Elis A.; and Burke, Robert L., to Massachusetts Institute of Technology. Method for metallizing aluminum pads of an integrated circuit chip. 4,372,996, Cl. 427-328.000.

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Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.

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Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., 4,373,066, Cl. 525-133.000.

Gulf & Western Manufacturing Company: *See*—
LaViolette, Paul A.; Caccioli, Anthony; Garcia, Alexander; Hotchkiss, Earl H.; and Marchitto, Alfred J., Jr., 4,372,016, Cl. 24-241.0PS.

Gullberg, Claes-Ake: *See*—
Larsson, Lars-Ake L.; Gullberg, Claes-Ake; Stenberg, Kaj; and Boberg, Nils G. E., 4,372,484, Cl. 494-14.000.

Gulliksen, John E., to Koehler Manufacturing Company. Methods and apparatus for controlling reflected light. 4,373,178, Cl. 362-280.000.

Gundel, Janos: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,100, Cl. 542-439.000.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,101, Cl. 542-440.000.

Gunesin, Binnur; Hamed, Gary R.; Kang, Jung W.; and Schulz, Donald N., to Firestone Tire & Rubber Company, The. Thermally reversible copolymers and process for the preparation thereof. 4,373,068, Cl. 525-218.000.

Gunn, Dennis L. Method for making an ear plug. 4,372,904, Cl. 264-134.000.

Gunneman, Paul. Blowing nozzle having a shielded blowing aperture, adapted for use in a shuttleless weaving machine. 4,372,348, Cl. 139-435.000.

Gupta, Ramesh K., to Clarex Manufacturing Limited. Blended plastomeric and elastomeric rubber latex sponge. 4,373,033, Cl. 521-70.000.

Gustafson, Inc.: *See*—
Rushing, Kyle W., 4,372,080, Cl. 47-57.600.

Gustin, Pol A. G. J.; and Schayes, Raymond G. G., to U.S. Philips Corporation. Method of manufacturing electrostatic write head. 4,372,045, Cl. 29-846.000.

Gutz, Kenneth H., to United States of America, Navy. Rotating electric machine having a toroidal wound motor winding. 4,373,148, Cl. 318-254.000.

Gyogyszerkutato Intezet: *See*—
Ambrus, Gabor; Toth-Sarudy, Eva; Cseh, Gyorgy; Barta, Istvan; and Horvath, Gyula, 4,372,973, Cl. 424-305.000.

H. & P. Kaas System Teknik ApS: *See*—
Kaas, Povl, 4,372,860, Cl. 210-748.000.

Haaf, William R.; Katchman, Arthur; and Lee, Gim F., Jr., to General Electric Company. Impact resistant polyphenylene ether resin compositions containing radial teleblock copolymers. 4,373,055, Cl. 524-505.000.

Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, to Hewlett-Packard Company. Logic state analyzer. 4,373,193, Cl. 364-900.000.

Haage, Hans-Jurgen: *See*—
Disteldorf, Josef; Hubel, Werner; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,373,088, Cl. 528-338.000.

Haas, Franz: *See*—
Hildebrand, Dietrich; and Haas, Franz, 4,372,744, Cl. 8-400.000.

Haasl, Michael J.; Snider, Kenneth D.; and Murphy, William L., to Pillsbury Company, The. Refrigerated shelf stable dough. 4,372,982, Cl. 426-549.000.

Habenstein, Klaus, to Behringwerke Aktiengesellschaft. Agent for detecting peroxidatively active substances and the use of a polyvinylmethylacylamide in such an agent. 4,372,746, Cl. 436-66.000.

Hachenberg, Horst: *See*—
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, 4,372,878, Cl. 252-455.00Z.

Hadler, Malcolm R.; Woodward, David R.; and Godfrey, Andrew A., to Shell Internationale Research Maatschappij B.V. Benzofuran acetic acid esters and their arthropocidal compositions. 4,372,970, Cl. 424-282.000.

Haehnel, Rudolf H.: *See*—
Iannucci, Vincent A.; and Haehnel, Rudolf H., 4,372,191, Cl. 87-48.000.

Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., to General Dynamics, Pomona Division. Undersea weapon with hydropulse system and periodical seawater admission. 4,372,239, Cl. 114-20.00A.

Hagiwara, Miyuki; and Morita, Yousuke, to Japan Atomic Energy Research Institute. Flame-retardant and radiation-resistant polymer composition and a resin molded product prepared therefrom. 4,373,046, Cl. 524-285.000.

Haig, Frederic D. Synthetic plastics coating. 4,372,994, Cl. 427-195.000.

Hair Free Centers: *See*—
Shapiro, Julius; and Eliason, Andrew, 4,372,315, Cl. 128-303.180.

Hakansson, Jan T.: *See*—
Dilot, Rolf M.; and Hakansson, Jan T., 4,372,797, Cl. 156-249.000.

Halasz, Laszlo, to Gould Inc. Method for making ink jet writing devices. 4,372,773, Cl. 65-108.000.

Halbach & Braun: *See*—
Braun, Gert, 4,372,619, Cl. 299-43.000.

Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,372,889, Cl. 260-413.000.

Hale, Albert L.: *See*—
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., 4,372,535, Cl. 254-319.000.

Hale, John M.; and Weber, Eugen, to Orbisphere Corporation Wilmington. Device for mounting and securing a membrane on an amperometric cell. 4,372,021, Cl. 29-235.000.

Hale, Peter: *See*—
Koster, Robertus J. C.; Six, Volker; and Hale, Peter, 4,372,882, Cl. 252-529.000.

Hall, Glenn E.: *See*—
Anderson, Robert J.; and Hall, Glenn E., 4,372,053, Cl. 34-11.000.

Hall, Lowell R., to Caterpillar Tractor Co. System with constant force actuator. 4,372,193, Cl. 91-420.000.

Hall, Wilbur S.: *See*—
Steinbrecher, Lester; and Hall, Wilbur S., 4,373,050, Cl. 524-405.000.

Halliburton Company: *See*—
Barrington, Burchus Q.; Clayton, Wilbur P.; and Jackson, Gerald D., 4,372,391, Cl. 166-373.000.
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Brandell, John T., 4,372,387, Cl. 166-334.000.
Carter, Ernest E., Jr., 4,372,562, Cl. 277-34.000.
Knox, Lloyd C., 4,372,704, Cl. 405-225.000.
Skinner, Neal G., 4,372,388, Cl. 166-334.000.

Halon, Bernard: *See*—
Vossen, John L., Jr.; and Halon, Bernard, 4,372,807, Cl. 156-643.000.

Hamamura, Hideki: *See*—
Takahashi, Masaaki; and Hamamura, Hideki, 4,372,805, Cl. 156-642.000.

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Gunesin, Binnur; Hamed, Gary R.; Kang, Jung W.; and Schulz, Donald N., 4,373,068, Cl. 525-218.000.

Hammett, Dillard S., to SEDCO, Inc. Stab water supply system. 4,372,395, Cl. 169-69.000.

Hammond, James A., to Colamco, Inc. Process for making curable adhesive polyurethane products. 4,373,057, Cl. 524-700.000.

Hamparian, Nshan: *See*—
Ford, Harry S., Jr.; and Hamparian, Nshan, 4,372,120, Cl. 60-605.000.

Hamrick, Joseph T.; and Rose, Leslie C., to Well-Pack Systems, Inc. Downhole water pump and method of use. 4,372,389, Cl. 166-369.000.

Hanabusa, Takayoshi; Yamamoto, Kenji; Umemoto, Shinzi; Kurosawa, Keiji; and Yamashita, Mitsuo, to Fujitsu Limited. Method for making multilayer printed wiring board. 4,372,804, Cl. 156-631.000.

Hanlon, Albert W., to Admore, Inc. Display. 4,372,086, Cl. 52-36.000.

Hannula, Rodney R.: *See*—
Brochman, Wilfred R.; Hannula, Rodney R.; and Jorgensen, Bradley H., 4,372,460, Cl. 220-258.000.

Hansen, Glen D.: *See*—
Buschbom, Floyd E.; Henke, Donald L.; and Hansen, Glen D., 4,372,729, Cl. 414-700.000.

Hansen, Guenter: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,372,885, Cl. 260-158.000.

Hanson, Paul A.; Hightower, John D.; and Strickland, Alvah T., to United States of America, Navy. Method for deployment of a towed array from a swath ship. 4,372,359, Cl. 114-244.000.

Hansson, Gunnar C., to Atlas Copco Aktiebolag. Pneumatic hoist. 4,372,534, Cl. 254-269.000.

Hantke, Hans-Jurgen: *See*—
von der Decken, Claus-Benedict; Hantke, Hans-Jurgen; and Sturmer, Walter, 4,372,912, Cl. 376-381.000.

Hara, Yoshio; and Shibata, Tadayoshi, to Fuji Photo Film Co., Ltd. Film unit containing pack. 4,372,660, Cl. 354-180.000.

Harbor Tool Mfg. Inc.: *See*—
Stratta, Peter J.; Stratta, John G.; and Camp, Douglas M., 4,372,006, Cl. 16-105.000.

Harigane, Kotaro; Takahashi, Kenichi; Shudo, Hirokazu; and Tando, Shuichi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Apparatus for mounting chip type circuit elements on printed circuit boards. 4,372,802, Cl. 156-538.000.

Harjar, Martin J.; and Noss, Jeffrey S., to Nordson Corporation. Apparatus for calibrating link position transducers of a teaching robot and a work robot. 4,372,721, Cl. 414-5.000.

Harkins, Samuel J., to Tyco Industries, Inc. Apparatus for coupling and uncoupling toy tractors and semitrailers. 4,372,075, Cl. 46-1.00K.

Harned, Frederich C.; and Galloway, Scott M., to Continental Group, Inc., The. Self-locking tray with integral divider. 4,372,476, Cl. 229-16.00A.

Harper, Peter W., to Bendix Corporation, The. Quadrature trigger system for sequential fuel injection. 4,372,273, Cl. 123-490.000.

Harrison, William E., to Interco Incorporated. Thread cutting device for sewing machine. 4,372,236, Cl. 112-291.000.

Hart, Douglas G., to High-Speed Spinning, Inc. False twist device. 4,372,107, Cl. 57-346.000.

Harte, Bruce D.: *See—*
Fette, Bruce A.; Harte, Bruce D.; and Tennyson, Bill E., 4,373,191, Cl. 364-724.000.
Hartl, Gerhard: *See—*
Schonthaler, Karl; and Hartl, Gerhard, 4,372,488, Cl. 238-8.000.
Hartmann & Braun Aktiengesellschaft: *See—*
Fabinski, Walter; Deptolla, Udo; and Ascherfeld, Margareta, 4,373,137, Cl. 250-343.000.
Harvey, Richard D.: *See—*
Hubbard, E. Daniel; and Harvey, Richard D., 4,373,099, Cl. 536-105.000.
Harvey, Robert P., to McGuire-Nicholas Manufacturing Company. Tool holder. 4,372,468, Cl. 224-268.000.
Hasegawa, Taiji: *See—*
Ishii, Toshio; Mouri, Yasunori; Abe, Osamu; and Hasegawa, Taiji, 4,373,187, Cl. 364-431.060.
Hashimoto, Shinichi: *See—*
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,373,106, Cl. 564-85.000.
Haskett, Thomas E.; and Schmitt, Joseph J., to Minnesota Mining and Manufacturing Company. EDM Electrodes. 4,373,127, Cl. 219-69.00E.
Hass, Robert H., to Union Oil Company of California. Process for removing SO_x and NO_x compounds from gas streams. 4,372,932, Cl. 423-351.000.
Hatfield, Frederick C. Weight lifting device and method of exercising. 4,372,553, Cl. 272-119.000.
Hatzikelis, Christopher; Madonia, Ciro; and Cosentino, Cesare C. Pliable edge protector. 4,372,083, Cl. 49-462.000.
Haugeneder, Hans; and Panzhauser, Erich. Casing for building works. 4,372,373, Cl. 165-54.000.
Haukelt, Helmut: *See—*
Ehlers, Joern; and Haukelt, Helmut, 4,372,866, Cl. 252-70.000.
Hauni-Werke Korber & Co. KG: *See—*
Kasparek, Alois; and Burger, Jurgen, 4,372,710, Cl. 406-28.000.
Hayashi, Torahiko. Apparatus for adjusting intervals of objects being conveyed. 4,372,438, Cl. 198-459.000.
Hayashi, Toshio: *See—*
Toyoda, Kazuhiro; Ono, Chikai; and Hayashi, Toshio, 4,373,195, Cl. 365-154.000.
Haynes, Herbert E., Jr.: *See—*
Dufresne, Raymond A., 4,372,636, Cl. 339-237.000.
Hazen, Gretz L., to Dec International, Inc. Method of making cheese. 4,372,983, Cl. 426-582.000.
Heasley, Raymond E.: *See—*
Anderson, Harry E.; and Heasley, Raymond E., 4,372,020, Cl. 29-81.00H.
Heat and Control, Inc.: *See—*
Caridis, Andrew A.; Benson, Clark K.; and Caridis, Anthony A., 4,372,200, Cl. 99-404.000.
Heat Power Products Corporation: *See—*
Sebald, Joseph F., deceased, 4,372,126, Cl. 60-669.000.
Hebard, Arthur F.: *See—*
Fulton, Theodore A.; and Hebard, Arthur F., 4,373,138, Cl. 307-277.000.
Heckele, Helmut, to Richard Wolf GmbH. Endoscopes. 4,372,295, Cl. 128-4.000.
Hecken, Rudolf P., to Bell Telephone Laboratories, Incorporated. Space diversity signal combiner. 4,373,207, Cl. 455-139.000.
Heckethorn, John E., to Heckethorn Manufacturing Co. U-Bolt exhaust system clamp with double saddle. 4,372,017, Cl. 24-277.000.
Heckethorn Manufacturing Co.: *See—*
Heckethorn, John E., 4,372,017, Cl. 24-277.000.
HEF Technische Entwicklung GmbH & Co. KG: *See—*
Janke, Bernhard, 4,372,084, Cl. 49-477.000.
Hefftler, Victor: *See—*
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, 4,372,209, Cl. 101-409.000.
Heidan, Klaus, to Greenville Steel Textile Machinery Corporation. Horizontal washer apparatus. 4,372,135, Cl. 68-22.00R.
Helbron, John W.: *See—*
Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.
Helgorsky, Jacques; and Leveque, Alain, to Rhone-Poulenc Industries. Purification of solutions of gallium values by liquid/liquid extraction. 4,372,923, Cl. 423-112.000.
Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, to Astra Lakemedel Aktiebolag. Phosphonoformic acid esters. 4,372,894, Cl. 260-941.000.
Helms, Horace H.: *See—*
Rozner, Alexander G.; and Helms, Horace H., 4,372,213, Cl. 102-301.000.
Hemco Wire Products, Inc.: *See—*
Myers, John W., 4,372,351, Cl. 140-112.000.
Hemmi, Keizi: *See—*
Kitamori, Nobuyuki; Hemmi, Keizi; and Mseno, Masaya, 4,372,968, Cl. 424-280.000.
Henderson, Donald L. Insulating and draft preventing automatic shutter for attic and other exhaust type fans. 4,372,196, Cl. 98-116.000.
Henke, Donald L.: *See—*
Buschbom, Floyd E.; Henke, Donald L.; and Hansen, Glen D., 4,372,729, Cl. 414-700.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Saran, Herbert; Witthaus, Martin; Smulders, Eduard; and Schwadtke, Karl, 4,372,868, Cl. 252-102.000.
Upadek, Horst; and Bruns, Klaus, 4,372,880, Cl. 252-522.00R.
Henney, John W.: *See—*
Deaton, Ivor E.; and Hennesy, John W., 4,372,902, Cl. 264-65.000.
Henry, Arnold W.: *See—*
Azar, Jack C.; Henry, Arnold W.; and Ferguson, Robert M., 4,372,246, Cl. 118-60.000.
Henthorn, Marcus D. Runner planter means. 4,372,229, Cl. 111-86.000.
Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See—*
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Herberts Gesellschaft mit Beschrankter Haftung: *See—*
Patzschke, Hans-Peter; and Gobel, Armin, 4,373,059, Cl. 524-761.000.
Patzschke, Hans-Peter; and Gobel, Armin, 4,373,072, Cl. 525-438.000.
Herbst, Wayne R., to Teletype Corporation. Method and means of reading punched data tape. 4,373,114, Cl. 178-17.00D.
Herdzina, Frank J.; Kossmann, Hans; and Lemke, Harold C., to American Can Company. Forming of end closures. 4,372,720, Cl. 413-56.000.
Herfeld, Friedrich W. Double-cone rotating mixer. 4,372,686, Cl. 366-220.000.
Herkert, Claus-Michael: *See—*
Brunach, Klaus; Herkert, Claus-Michael; and Thomasmueller, Dieter, 4,372,795, Cl. 156-155.000.
Herlow, Erik: *See—*
Daenen, Robert H. C. M.; and Herlow, Erik, 4,372,526, Cl. 249-119.000.
Hermann, Kurt: *See—*
Wojtech, Bernhard; Kiessling, Hans-Joachim; Becker, Wilhelm; and Hermann, Kurt, 4,373,073, Cl. 525-507.000.
Herold, Georg; and Kabs, Hermann, to Siemens Aktiengesellschaft. Method for manufacturing plastic electrical insulators. 4,372,907, Cl. 264-265.000.
Herrmann, Fred. Tape dispenser. 4,372,472, Cl. 225-80.000.
Herrold, Anne M., to Eli Lilly and Company. Cosmetic cream formulation. 4,372,944, Cl. 424-83.000.
Herscher, Lee R.: *See—*
Goertzen, Gerold G.; and Herscher, Lee R., 4,372,397, Cl. 172-42.000.
Herve, Paul: *See—*
Tison, Eric; and Herve, Paul, 4,372,206, Cl. 101-228.000.
Herz, Andre M., to Minigrip, Inc. Method of joining flexible fastener strips to flexible web. 4,372,793, Cl. 156-66.000.
Herzan, Georg; and Simeth, Claus, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Lithographic sheet fed press having means for clearing a jamming condition. 4,372,204, Cl. 101-145.000.
Hess, Paul D., to Allis-Chalmers Corporation. Method for heat treating pulverous raw material calcining combustor therefor. 4,372,784, Cl. 106-100.000.
Hess, Peter: *See—*
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, 4,372,521, Cl. 248-430.000.
Hewlett-Packard Company: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,373,193, Cl. 364-900.000.
Rockwell, Martin G., 4,372,324, Cl. 128-695.000.
Hi-Life Rubber, Inc.: *See—*
Larson, Leigh R., 4,372,250, Cl. 119-14.470.
Hibbel, Josef; Schleper, Bernard; and Scheve, Heinrich, to Ruhrchemie Aktiengesellschaft. Radiation boiler. 4,372,253, Cl. 122-7.00R.
Hicks, John W., Jr. Multi-fiber fiber-optic assembly method. 4,372,769, Cl. 65-4.210.
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, to Takeda Chemical Industries, Ltd. Culture of Nocardia ATCC 31309. 4,373,028, Cl. 435-253.000.
High-Speed Spinning, Inc.: *See—*
Hart, Douglas G., 4,372,107, Cl. 57-346.000.
Hightower, John D.: *See—*
Hanson, Paul A.; Hightower, John D.; and Strickland, Alvah T., 4,372,359, Cl. 114-244.000.
Hilbert, Lloyd E.; and Samples, Randall H. Method of recovering pure toluene diisocyanate from a polymeric residue product. 4,372,891, Cl. 260-453.0SP.
Hildebrand, Dietrich; and Haas, Franz, to Bayer Aktiengesellschaft. Process for dyeing cellulose materials with reactive dyestuffs by the exhaustion method. 4,372,744, Cl. 8-400.000.
Hildebrandt, Edmund. Hydraulic heat generator. 4,372,254, Cl. 122-26.000.
Himmel, Richard P.: *See—*
Scapple, Robert Y.; Keister, Frank Z.; Grieger, Robert G.; and Himmel, Richard P., 4,372,037, Cl. 29-613.000.
Hinden, Milton, to Duro Dyne Corporation. Retractable damper bearing assembly. 4,372,627, Cl. 384-260.000.
Hinrichs, Carl B.: *See—*
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., 4,372,629, Cl. 312-223.000.
Hirano, Reiji: *See—*
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,372,655, Cl. 351-206.000.
Hirose, Fumio: *See—*
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.

Hitachi Kyowa Kogyo, Ltd.: *See*—
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, 4,372,859, Cl. 210-739.000.
Hitachi, Ltd.: *See*—
Ishii, Toshio; Mouri, Yasunori; Abe, Osamu; and Hasegawa, Taiji, 4,373,187, Cl. 364-431.060.
Matsumura, Akira, 4,373,161, Cl. 343-717.000.
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, 4,372,859, Cl. 210-739.000.
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.
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Hjelmeland, Leonard M., to United States of America, Health & Human Services. Nondenaturing zwitterionic detergents. 4,372,888, Cl. 260-397.100.
Hoechst Aktiengesellschaft: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,372,892, Cl. 260-458.00C.
Ritz, Jurgen; Fischer, Hannes; and Plum, Helmut, 4,373,078, Cl. 526-317.000.
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Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, 4,372,878, Cl. 252-455.00Z.
Hoelzen, Warren R.; Prescott, John F.; and Tyler, Michael N., to United States of America, Navy. Composite safe and arming mechanism for guided missile. 4,372,212, Cl. 102-264.000.
Hofbauer, Peter; Gaschler, Erich; and Schwarz, Cornelia, to Volkswagenwerk AG. Drive aggregate for a heat pump. 4,372,257, Cl. 123-68.000.
Hoffman, Arnold; and Engelstein, Shmuel, to Hoffman, Arnold. Method and apparatus for producing a high speed high resolution radiation sensitive article and a high speed high resolution radiation sensitive article. 4,373,022, Cl. 430-434.000.
Hoffmann, Gerhart: *See*—
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhart, 4,372,875, Cl. 252-413.000.
Hogue, Utah. Framing layout method and device. 4,372,049, Cl. 33-36.000.
Holdsworth, Alan S., to McCorquodale Machine Systems Limited. Stitching assembly. 4,372,473, Cl. 227-3.000.
Holehouse, Joseph G.: *See*—
Kyung, Jai H.; and Holehouse, Joseph G., 4,372,933, Cl. 423-365.000.
Hollister, Charles W. High pressure oil/gas fired closed loop furnace. 4,372,487, Cl. 237-56.000.
Holm, Ronald T.: *See*—
Singer, Arnold H.; and Holm, Ronald T., 4,372,642, Cl. 350-96.120.
Holpuch, Vladimir: *See*—
Landa, Vaclav; Vitek, Jaromir; Nejedly, Pavel; Holpuch, Vladimir; Bubelis, Juozas; and Stepanovicius, Atanas-Nemezyus, 4,372,826, Cl. 204-43.00T.
Holz, George E.; and Tezucar, Okan K., to Burroughs Corporation. System for operating a display panel. 4,373,157, Cl. 340-805.000.
Holzenberger, Kurt, to Klein, Schanzlin & Becker Aktiengesellschaft. Rotary distributor valve. 4,372,337, Cl. 137-240.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Takayuki; and Suda, Hitoshi, 4,372,412, Cl. 180-90.000.
Osada, Isao; and Sano, Shoichi, 4,372,365, Cl. 152-158.000.
Otobe, Yutaka; and Kawamoto, Michio, 4,372,277, Cl. 123-571.000.
Tsuchiya, Toshio; Enokimoto, Akito; Mizushima, Sadao; and Takano, Suwaji, 4,372,602, Cl. 296-78.00R.
Watanabe, Masaki; and Wakatsuki, Goroei, 4,372,415, Cl. 180-215.000.
Yamamoto, Hitoshi; Watanabe, Masaki; and Shido, Nobuhiro, 4,372,417, Cl. 180-215.000.
Honda, Satoru: *See*—
Sunaga, Yoshimitsu; and Honda, Satoru, 4,373,170, Cl. 360-71.000.
Hondo, Tadahiro: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.
Honeywell Inc.: *See*—
Bohan, John E., Jr., 4,373,201, Cl. 371-68.000.
Mykkanen, C. Fred, 4,373,175, Cl. 361-220.000.
Honeywell Information Systems Inc.: *See*—
Jacobsthal, Herbert K., 4,373,152, Cl. 340-347.0DD.
Horak, Richard F.: *See*—
Bennett, Benjamin R.; McBee, Leroy D.; and Horak, Richard F., 4,372,129, Cl. 62-175.000.
Horaud, Florian: *See*—
Berneman, Armand; David, Alain; Horaud, Florian; and Segard, Emile, 4,373,027, Cl. 435-240.000.
Horey, Leonard I.: *See*—
Dunn, William H.; and Horey, Leonard I., 4,372,232, Cl. 112-158.00E.
Hori, Masao: *See*—
Asai, Yoshihiko; Hori, Masao; and Tokumitsu, Naoki, 4,373,128, Cl. 219-73.110.
Horner, Ellwood J., to American Hoechst Corporation. Precision planar positioning device. 4,372,677, Cl. 355-41.000.
Horowitz, Jeffrey S.: *See*—
Nelson, Paul A.; and Horowitz, Jeffrey S., 4,372,376, Cl. 165-104.120.
Horton, Lowell C., to Hosner, Joe G. Polymer concrete comprising furfuryl alcohol resin. 4,373,058, Cl. 524-705.000.
Horvath, Gyula: *See*—
Ambrus, Gabor; Toth-Sarudy, Eva; Csch, Gyorgy; Barta, Istvan; and Horvath, Gyula, 4,372,973, Cl. 424-305.000.
Hosner, Joe G.: *See*—
Horton, Lowell C., 4,373,058, Cl. 524-705.000.
Hosoe, Mamoru: *See*—
Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, 4,372,319, Cl. 128-421.000.
Hosonaga, Taketoshi: *See*—
Mizushima, Yoichi; and Hosonaga, Taketoshi, 4,372,607, Cl. 297-325.000.
Hotchkiss, Earl H.: *See*—
LaViolette, Paul A.; Caccioli, Anthony; Garcia, Alexander; Hotchkiss, Earl H.; and Marchitto, Alfred J., Jr., 4,372,016, Cl. 24-241.0PS.
Hotta, Mitsuhiko, to Kabushiki Kaisha Morita Seisakusho. Treatment chair. 4,372,608, Cl. 297-361.000.
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., to Le Materiel Telephonique Thomson-CSF. Stochastic demodulator for phase jump-modulated signals, operating in time divided up over several channels. 4,373,151, Cl. 329-104.000.
Howarth, Thomas T.; and Hunt, Eric, to Beecham Group Limited. Clavulanic acid derivatives their preparation and use. 4,372,946, Cl. 424-114.000.
Hoya Lens Corporation: *See*—
Tarumi, Niro; Sugimura, Mitsuo; Komiya, Shigeo; and Tsuchiya, Makoto, 4,373,076, Cl. 526-261.000.
Hsieh, Jaw J., to Massachusetts Institute of Technology. Method for fabricating DH lasers. 4,372,791, Cl. 148-171.000.
Hubbard, E. Daniel; and Harvey, Richard D., to Grain Processing Corporation. Continuous process for preparation of a thinned cationic starch paste. 4,373,099, Cl. 536-105.000.
Hubbard, Vance M.; and Brunson, Welton K., to Tecnol, Inc. Arm sling. 4,372,301, Cl. 128-94.000.
Hubel, Werner: *See*—
Disteldorf, Josef; Hubel, Werner; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,373,088, Cl. 528-338.000.
Hubner, Heinz-Joachim: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,372,836, Cl. 204-159.230.
Hudson, Robert J.: *See*—
Dowding, John G.; Turner, Peter R.; and Hudson, Robert J., 4,373,188, Cl. 364-552.000.
Hudson's Bay Oil and Gas Company Limited: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Hughes Aircraft Company: *See*—
Johnson, Kenneth C., 4,372,639, Cl. 350-3.700.
Scapple, Robert Y.; Keister, Frank Z.; Grieger, Robert G.; and Himmel, Richard P., 4,372,037, Cl. 29-613.000.
Hughes, George F., to Diamagnetics, Inc. Method for manufacturing diamond pick-up stylus. 4,372,042, Cl. 29-825.000.
Hughes, Nathaniel, to Vortech Sciences, Inc. Vortex generating mass flowmeter. 4,372,169, Cl. 73-861.520.
Hughes Tool Company: *See*—
Baugh, John L.; Montgomery, James W.; and Roach, Malcolm B., 4,372,390, Cl. 166-373.000.
Humanicare International Inc.: *See*—
Fowler, George B., 4,372,309, Cl. 128-284.000.
Hung, Chi C. Five-smoke-flue type wet water box boiler. 4,372,255, Cl. 122-149.000.
Hunt, Eric: *See*—
Howarth, Thomas T.; and Hunt, Eric, 4,372,946, Cl. 424-114.000.
Hunt, Harold R., to Phillips Petroleum Company. Apparatus useful for foam breaking. 4,373,024, Cl. 435-41.000.
Hunter, Alex B.: *See*—
Pinson, George T.; and Hunter, Alex B., 4,372,216, Cl. 102-489.000.
Hunter, Raymond. Shower bath economizer. 4,372,372, Cl. 165-47.000.
Huntoon, Francis E., to Teletype Corporation. Apparatus for mounting a mirror. 4,372,519, Cl. 248-466.000.
Hurd, Edford N. Beehive frame and method of construction thereof. 4,372,000, Cl. 6-10.000.
Hutchison, Joseph A., to Solar Kinetics, Inc. Method of manufacturing parabolic trough solar collector. 4,372,027, Cl. 29-448.000.
Hutchison, Joseph A., to Solar Kinetics, Inc. Solar collector module. 4,372,651, Cl. 350-292.000.
Hutson, Thomas, Jr., to Phillips Petroleum Company. HF Alkylation process and apparatus. 4,373,110, Cl. 585-719.000.
Hutter, Wilhelm, to Aktiengesellschaft Adolph Saurer. Electrical warp thread-monitoring apparatus for a loom. 4,372,346, Cl. 139-353.000.
Hydrola Ltd.: *See*—
Kaganovsy, Yaacov; Kustanovich, Yosef; Shmuter, Shimshon; Gelfer, Vadim; and Muchnik, Shimon, 4,372,818, Cl. 202-83.000.
Hyma, Marvin J., to General Motors Corporation. Vehicle strut type suspension with alignment adjustment. 4,372,575, Cl. 280-661.000.
I.D. Engineering, Inc.: *See*—
Vandebult, Jan, 4,373,163, Cl. 343-842.000.
Iannucci, Vincent A.; and Haehnel, Rudolf H., to Rockwell International Corp. Rotary braiding machine. 4,372,191, Cl. 87-48.000.

Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, to Matsushita Electric Works, Ltd. Low frequency therapeutic instrument. 4,372,319, Cl. 128-421.000.
Ichinose, Isao: *See*—
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,372,457, Cl. 215-228.000.
Icking, Christian: *See*—
Kiestra, Philippus P.; and Icking, Christian, 4,372,249, Cl. 119-14.170.
Igarashi, Nihaku, to Yamaha Hatsudoki Kabushiki Kaisha. Tricycle vehicle. 4,372,416, Cl. 180-215.000.
Ihm, Gerald J., to Deere & Company. Drop hitch system. 4,372,573, Cl. 280-477.000.
Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition from cyanate ester and acrylic ester. 4,373,086, Cl. 528-322.000.
Ikemura, Masaaki: *See*—
Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, 4,372,938, Cl. 423-469.000.
Ikin, John B.; and Neale, Denis M., deceased (by Neale, Adeline L, executrix), to Ciba-Geigy AG. Light-mixing system. 4,372,678, Cl. 355-37.000.
Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-Etsu Chemical Co. Ltd. Polyvinyl alcohol-clad shaped article of vinyl chloride resin. 4,372,986, Cl. 427-40.000.
Imai, Akira: *See*—
Takemura, Yasuhiko; Okazaki, Takahisa; and Imai, Akira, 4,372,323, Cl. 128-660.000.
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. Sulfamoyl-substituted phenethylamine derivatives and process of producing them. 4,373,106, Cl. 564-85.000.
Imai, Yoshikazu: *See*—
Motonami, Masanao; Ogawa, Hisashi; and Imai, Yoshikazu, 4,372,580, Cl. 280-802.000.
Imanishi, Nobuyuki: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.
Imperial Chemical Industries Limited: *See*—
Short, Glyn D.; and Whittam, Thomas V., 4,372,930, Cl. 423-326.000.
Inaba, Nobuaki: *See*—
Sato, Hideyori; Inaba, Nobuaki; and Shinohara, Shigeru, 4,372,335, Cl. 137-101.000.
Independent Transfer Equipment Co.: *See*—
McCord, Lawless D., 4,372,452, Cl. 212-159.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Belisomi, Pietro, 4,373,208, Cl. 455-186.000.
Industriewerk Schaeffler OHG: *See*—
Koschmieder, Hartumut, 4,372,623, Cl. 308-6.00C.
Inesso, Richard X. Operator for sliding doors. 4,372,005, Cl. 16-52.000.
Ing. C. Olivetti & Co., S.p.A.: *See*—
Bovio, Michele; and Demonte, Filippo, 4,372,694, Cl. 400-88.000.
Ingham, John D.: *See*—
Mueller, William A.; Ingham, John D.; and Reilly, William W., 4,373,039, Cl. 523-205.000.
Inoue, Kanji, to NHK Spring Co., Ltd. Hollow stabilizer for vehicle. 4,372,576, Cl. 280-689.000.
Instytut Elektrotechniki Oddzial Technologii i Materialoznawstwa Elektrotechnicznego: *See*—
Winkler, Jerzy; and Stankiewicz, Jerzy, 4,373,113, Cl. 174-179.000.
Intel Corporation: *See*—
Bohr, Mark T., 4,372,034, Cl. 29-577.00C.
Intel Magnetics, Inc.: *See*—
Triplett, Baylor B.; Ferrando, Carlo; and Galli, Guido, 4,372,808, Cl. 156-655.000.
Interco Incorporated: *See*—
Harrison, William E., 4,372,236, Cl. 112-291.000.
Interlake, Inc.: *See*—
Rasmussen, George E.; and Donkle, Lucius B., Jr., 4,372,451, Cl. 211-187.000.
International Business Machines Corporation: *See*—
Babcock, David H., 4,372,697, Cl. 400-232.000.
Berdinner, Edward J., Jr., 4,372,671, Cl. 355-8.000.
Bergeron, D. L.; Fleming, Daniel J.; and Stephens, Geoffrey B., 4,373,166, Cl. 357-15.000.
Demke, Kent R.; and Dwire, Jerold D., 4,373,194, Cl. 364-900.000.
Means, Rodney J.; Plunkett, Galen P., Jr, Galen P.; Dennis, Charles A.; and Moon, John L., 4,373,183, Cl. 364-200.000.
Pries, Robert W., 4,372,672, Cl. 355-14.00R.
Quinn, Paul A., Jr., 4,372,699, Cl. 400-625.000.
Robinson, Neil L.; and Silkensen, Ralph D., 4,373,173, Cl. 360-121.000.
International Flavors & Fragrances, Inc.: *See*—
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,373,108, Cl. 568-817.000.
International Harvester Co.: *See*—
Chatterjea, Probir K., 4,372,408, Cl. 180-6.200.
International Minerals & Chemical Corp.: *See*—
Lawver, James E.; McClintock, Walter O.; and Snow, Robert E., 4,372,843, Cl. 209-12.000.
International Paper Company: *See*—
Phillips, Richard B.; Kempf, Arthur W.; and Eckert, Robert C., 4,372,812, Cl. 162-40.000.
International Playtex, Inc.: *See*—
Stern, Harold; and Suleiman, Elisabeth, 4,372,322, Cl. 128-491.000.
International Silicone Corporation: *See*—
Winn, R. Alastair, 4,373,009, Cl. 428-424.200.
International Standard Electric Corporation: *See*—
Black, Philip W., 4,372,648, Cl. 350-96.330.
International Telephone and Telegraph Corporation: *See*—
Watson, Christopher A., 4,372,168, Cl. 73-861.280.
International Tool & Supply Co., Inc.: *See*—
Toelke, Lester W., 4,372,003, Cl. 15-88.000.
Interox (Societe Anonyme): *See*—
Clerbois, Lucien; and Plumet, Lucien, 4,372,813, Cl. 162-48.000.
Inukai, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt retractor. 4,372,501, Cl. 242-107.000.
Inventure, Inc.: *See*—
Goodwin, John D., 4,373,005, Cl. 428-357.000.
Ionics, Incorporated: *See*—
Waite, Warren A., 4,373,031, Cl. 521-32.000.
Ipsen Industries International GmbH: *See*—
Gohring, Werner; and Luiten, Cornelius H., 4,372,790, Cl. 148-16.500.
Irwin, Rodney C., to Koppers Company, Inc. Aligning device. 4,372,819, Cl. 202-239.000.
Ishiguro, Kimiko: *See*—
Arai, Tadashi; Takahashi, Katsuhiro; Ishiguro, Kimiko; and Yokoyama, Koji, 4,372,947, Cl. 424-121.000.
Ishii, Toshio; Mouri, Yasunori; Abe, Osamu; and Hasegawa, Taiji, to Hitachi, Ltd. Corrective feedback technique for controlling air-fuel ratio for an internal combustion engine. 4,373,187, Cl. 364-431.060.
Ishikawa, Seiji: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.
Ishikawa, Wataru: *See*—
Masukawa, Toyoaki; Ishikawa, Wataru; Okaniwa, Kenichiro; and Yamashita, Kiyoshi, 4,373,017, Cl. 430-270.000.
Ishikawa, Yasuyuki: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,372,655, Cl. 351-206.000.
Ishikura, Tomoyuki: *See*—
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,373,094, Cl. 536-6.400.
Isobe, Kimiyasu: *See*—
Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,373,026, Cl. 435-191.000.
Isogai, Hideaki; and Tanaka, Miki, to Fujitsu Limited. Decoder circuit. 4,373,196, Cl. 365-189.000.
Ishiki, Minoru: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Ishiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
Itakura, Keiichi, to City of Hope Research Institute. Solid-phase synthesis of polynucleotides. 4,373,071, Cl. 525-375.000.
ITT Industries, Inc.: *See*—
Pitt, Gillies D.; and Williamson, Roger J., 4,372,165, Cl. 73-861.220.
Iwai, Tomio, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Lubricating system for outboard engine. 4,372,258, Cl. 123-73.0AD.
Iwata, Hiroshi; and Yamaoka, Tetsuo, to West Electric Co., Ltd. Device for indicating photographic exposure conditions. 4,372,657, Cl. 354-53.000.
Iwatani, Nobuo, to Nippon Seiko Kabushiki Kaisha. Moving table assembly. 4,372,223, Cl. 108-143.000.
J. M. Huber Corporation: *See*—
White, Herbert V., 4,372,221, Cl. 108-51.300.
J. M. Voith GmbH: *See*—
Wolf, Jakob; and Juhas, Simon, 4,372,816, Cl. 162-343.000.
J. R. Simplot Company: *See*—
Fisher, Wayland I.; and Petersen, Marvin J., 4,372,184, Cl. 83-98.000.
Jackson, Gerald D.: *See*—
Barrington, Burchus Q.; Clayton, Wilbur P.; and Jackson, Gerald D., 4,372,391, Cl. 166-373.000.
Jackson, Joseph J., to General Electric Company. Directionally strengthened copper alloy parts for a gas turbine. 4,372,789, Cl. 148-3.000.
Jackson, Otis. Vehicle exhaust system. 4,372,421, Cl. 181-243.000.
Jacob, Frederick W.: *See*—
Bobst, Robert W.; Garner, Billy J.; and Jacob, Frederick W., 4,372,758, Cl. 55-48.000.
Jacobson, Peter E.: *See*—
Allen, Terry S.; and Jacobson, Peter E., 4,372,633, Cl. 339-5.00M.
Jacobsthal, Herbert K., to Honeywell Information Systems Inc. Binary to one out of four converter. 4,373,152, Cl. 340-347.0DD.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Manufacture of articles by drawing. 4,372,908, Cl. 264-292.000.
James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,372,929, Cl. 423-323.000.

James, Kenneth A.: *See*—
Strahan, Virgil H.; James, Kenneth A.; and Quick, William H., 4,372,646, Cl. 350-96.310.
Janisch, Paul: *See*—
Bielz, Siegfried; Janisch, Paul; and Lohrberg, Karl, 4,372,939, Cl. 423-478.000.
Janke, Bernhard, to HEF Technische Entwicklung GmbH & Co. KG. Device for sealing a wing of a window, a door or the like in relation to a frame associated therewith. 4,372,084, Cl. 49-477.000.
Japan Atomic Energy Research Institute: *See*—
Hagiwara, Miyuki; and Morita, Yousuke, 4,373,046, Cl. 524-285.000.
Jay, Robert L.: *See*—
Caruthers, John E.; Jay, Robert L.; Riffel, Ronald E.; and Rothrock, Mark D., 4,372,157, Cl. 73-147.000.
JEB Energy Industries, Inc.: *See*—
Adams, Jerry W., 4,372,280, Cl. 123-557.000.
Jefferson, Francis D.: *See*—
Force, Wallace B., Jr.; and Jefferson, Francis D., 4,372,355, Cl. 142-55.000.
Jensen, Norman L., Jr.: *See*—
Chapman, Wilson M.; and Jensen, Norman L., Jr., 4,372,751, Cl. 44-2.000.
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, to Veb Kombinat Polygraph "Werner Lamberz". Sheet gripping jar arrangement. 4,372,209, Cl. 101-409.000.
Jiewertz, Sten R.: *See*—
Gillbrand, Per S.; Axelson, Simon E.; and Jiewertz, Sten R., 4,372,119, Cl. 60-600.000.
Jobmatic, Inc.: *See*—
Ostlund, Roland J. A., 4,372,218, Cl. 104-88.000.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,372,836, Cl. 204-159.230.
Johannson, Karl N.: *See*—
Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, 4,372,894, Cl. 260-941.000.
Johansson, Lennart, to Aktiebolaget Bofors. Method of manufacturing projectiles. 4,372,019, Cl. 29-1.230.
Johne, Hans: *See*—
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, 4,372,209, Cl. 101-409.000.
Johnson, Charles S. Amplification arrangement for violin sound bars. 4,372,189, Cl. 84-276.000.
Johnson & Johnson Baby Products Company: *See*—
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., 4,372,869, Cl. 252-174.160.
Johnson, Kenneth C., to Hughes Aircraft Company. Directional diffusing screen. 4,372,639, Cl. 350-3.700.
Johnson, Kenneth M.: *See*—
Killinger, Karl H.; Johnson, Kenneth M.; and Totino, Peter J., 4,372,234, Cl. 112-258.000.
Johnson, Leo F.; and Van Uitert, LeGrand G., to Bell Telephone Laboratories, Incorporated. Optical waveguide termination. 4,372,641, Cl. 350-96.120.
Johnson, Paul H., to Phillips Petroleum Company. Waste heat recovery. 4,372,937, Cl. 423-454.000.
Johnson, Richard F.: *See*—
Wiers, John W.; Roper, Daniel W.; and Johnson, Richard F., 4,372,612, Cl. 297-374.000.
Johnstone, Norman E.; and Kehoe, John R., to United States Gypsum Company. Paper having mineral filler for use in the production of gypsum wallboard. 4,372,814, Cl. 162-124.000.
Jonsson, Nils A.: *See*—
Moreau, Pierre D.; and Jonsson, Nils A., 4,372,954, Cl. 424-248.530.
Jorgensen, Bradley H.: *See*—
Brochman, Wilfred R.; Hannula, Rodney R.; and Jorgensen, Bradley H., 4,372,460, Cl. 220-258.000.
Jos. Schlitz Brewing Company: *See*—
Elert, Karl; and Westphal, John C., 4,372,143, Cl. 72-343.000.
Jost, Manfred: *See*—
Knoke, Jurgen; Jost, Manfred; Fahrbach, Erich; and Tecl, Bohuslav, 4,373,000, Cl. 428-198.000.
Joy Manufacturing Company: *See*—
Gude, Klaus E.; Felsvang, Karsten S.; and Coe, Everett L., 4,372,926, Cl. 423-244.000.
Jozic, Ljerka, to Wuelfing, Johann A. Anti-arrythmic sulphonamide compositions. 4,372,955, Cl. 424-250.000.
Juhas, Simon: *See*—
Wolf, Jakob; and Juhas, Simon, 4,372,816, Cl. 162-343.000.
Julie, Jean-Jacques: *See*—
Houdard, Jean-Pierre; Julie, Jean-Jacques; and Leoni, Bernard G., 4,373,151, Cl. 329-104.000.
Jung, Alfred K.; Silberberg, Joseph; and Weil, Edward D., to Stauffer Chemical Company. Dibromoneopentyl phosphate melamine salt flame retardant. 4,373,103, Cl. 544-195.000.
Justusson, William M.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,372,112, Cl. 60-323.000.
Kaas, Povl, to H. & P. Kaas System Teknik ApS. Method and an apparatus for cleaning water in a swimming pool. 4,372,860, Cl. 210-748.000.
Kabs, Hermann: *See*—
Herold, Georg; and Kabs, Hermann, 4,372,907, Cl. 264-265.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Suzuki, Keiichi, 4,372,046, Cl. 29-852.000.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, 4,372,883, Cl. 260-112.00R.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Tamura, Shoichi; Asami, Takayoshi; and Sonoi, Hidekazu, 4,372,765, Cl. 62-29.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ota, Shingo, 4,372,178, Cl. 74-512.000.
Sato, Hideyori; Inaba, Nobuaki; and Shinohara, Shigeru, 4,372,335, Cl. 137-101.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Hotta, Mitsuhiko, 4,372,608, Cl. 297-361.000.
Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Tomioka, Soichiro; and Komiya, Yasuo, 4,372,486, Cl. 236-92.00B.
Kadono, Tetsuro: *See*—
Okumura, Tamotsu; and Kadono, Tetsuro, 4,372,850, Cl. 210-198.300.
Kaganovsy, Yaacov; Kustanovich, Yosef; Shmuter, Shimshon; Gelfer, Vadim; and Muchnik, Shimon, to Hydrola Ltd. Apparatus for the distillation and rectification of mixtures. 4,372,818, Cl. 202-83.000.
Kahn, Leonard R. Predictive distortion reduction in AM stereo transmitters. 4,373,115, Cl. 179-1.0GS.
Kai, Tomokazu: *See*—
Suzuki, Yoshiharu; and Kai, Tomokazu, 4,373,206, Cl. 455-103.000.
Kajihara, Takehiro: *See*—
Kaneno, Masayuki; and Kajihara, Takehiro, 4,373,030, Cl. 501-152.000.
Kamyr, Inc.: *See*—
Richter, Johan C. F. C.; and Sherman, Michael I., 4,372,711, Cl. 406-63.000.
Kanamori, Hiroshi: *See*—
Sano, Isao; and Kanamori, Hiroshi, 4,373,153, Cl. 340-87.000.
Kaneda, Ryoichi, to Trio Kabushiki Kaisha. Method and circuitry for controlling the intermediate frequency of an FM receiver to lessen phase distortion. 4,373,209, Cl. 455-208.000.
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, to UBE Industries Ltd. O-Tolidine sulfone based copolyamide fiber. 4,373,087, Cl. 528-337.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
Kaneno, Masayuki; and Kajihara, Takehiro, to NGK Insulators, Ltd. Polycrystalline translucent alumina sintered body, a method for producing the same and a high pressure vapor discharge lamp obtained by using said sintered body. 4,373,030, Cl. 501-152.000.
Kang, Jung W.: *See*—
Gunesin, Binnur; Hamed, Gary R.; Kang, Jung W.; and Schulz, Donald N., 4,373,068, Cl. 525-218.000.
Kaniut, Herbert, to Ford Motor Company. Stopping and restarting device for the internal combustion engine of a motor vehicle. 4,372,262, Cl. 123-179.00J.
Kanou, Ikuo: *See*—
Yanagiuchi, Shigenobu; and Kanou, Ikuo, 4,373,192, Cl. 364-900.000.
Kao Soap Co., Ltd.: *See*—
Sato, Toshio; Suzuki, Sho; and Ohmura, Hidemasa, 4,373,053, Cl. 524-457.000.
Yagi, Kazuhisa; Suzuki, Sho; and Nakashima, Norihiko, 4,373,043, Cl. 524-130.000.
Kapaun, Gustav: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,372,892, Cl. 260-458.00C.
Karabinis, Peter D.; and Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Space diversity combiner. 4,373,210, Cl. 455-273.000.
Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., to Gulf Oil Corporation. Polymer compositions. 4,373,066, Cl. 525-133.000.
Karl, Reiner: *See*—
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, 4,372,209, Cl. 101-409.000.
Kasiewicz, Stanley J. Control circuit for engine speed governor with power take off. 4,372,265, Cl. 123-352.000.
Kasparek, Alois; and Burger, Jurgen, to Hauni-Werke Korber & Co. KG. Apparatus for manipulating filter rod sections or the like between producing and processing machines. 4,372,710, Cl. 406-28.000.
Katchman, Arthur: *See*—
Haaf, William R.; Katchman, Arthur; and Lee, Gim F., Jr., 4,373,055, Cl. 524-505.000.
Kato, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Electrical contact composition for a vacuum type circuit interrupter. 4,372,783, Cl. 75-246.000.
Kato, Shogenobu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Plastic valve having a cap nut coupler. 4,372,529, Cl. 251-151.000.
Kato, Toshikazu: *See*—
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Kato, Yasuhiko: *See*—
Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Taneyoshi; Takashima, Koichi; and Kato, Yasuhiko, 4,372,846, Cl. 210-86.000.
Katsumata, Yutaka, to Fujitsu Limited. Dynamic address translation system. 4,373,179, Cl. 364-200.000.

Katsura, Toshio: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.
Katz, Edward R. Door protector. 4,372,364, Cl. 150-52.00R.
Kaufman, Jack W.: *See*—
Blake, Joseph W., III; and Kaufman, Jack W., 4,372,316, Cl. 128-325.000.
Kaufmann, Kenneth M., to Pako Corporation. Automatic variable-quantity/fixed-time anti-oxidation replenisher control system. 4,372,665, Cl. 354-298.000.
Kaufmann, Kenneth M., to Pako Corporation. Automatic variable-quantity/variable-time anti-oxidation replenisher control system. 4,372,666, Cl. 354-298.000.
Kausch, Erwin; and Todter, Folkhard, to B.A.T. Cigaretten-Fabriken GmbH. Fibrous material for tobacco smoke filter. 4,372,328, Cl. 131-332.000.
Kawaguchi, Masashi: *See*—
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, 4,372,859, Cl. 210-739.000.
Kawamoto, Michio: *See*—
Otobe, Yutaka; and Kawamoto, Michio, 4,372,277, Cl. 123-571.000.
Kawamura, Atsushi: *See*—
Fujioka, Yoshisato; and Kawamura, Atsushi, 4,372,654, Cl. 350-427.000.
Kawana, Akio: *See*—
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,372,647, Cl. 350-96.330.
Kawasaki, Kunio: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
Kazlauskas, Gasparas, to Astro-Arc Company. Apparatus for welding pipes. 4,373,125, Cl. 219-60.00A.
Kean, James P., Jr., to Process Control Corporation. Bulk material receiver. 4,372,713, Cl. 406-172.000.
Keffeler, Paul J. Medication dispenser. 4,372,445, Cl. 206-532.000.
Kehoe, John R.: *See*—
Johnstone, Norman E.; and Kehoe, John R., 4,372,814, Cl. 162-124.000.
Keister, Frank Z.: *See*—
Scapple, Robert Y.; Keister, Frank Z.; Grieger, Robert G.; and Himmel, Richard P., 4,372,037, Cl. 29-613.000.
Keith, Alfred H., to Dairy Farm Leasing Company. Prefabricated animal shelter. 4,372,251, Cl. 119-16.000.
Kelley Company Inc.: *See*—
Erlandsson, Kjell I., 4,372,226, Cl. 110-238.000.
Kellie, Truman F., to Minnesota Mining and Manufacturing Company. Extended area diffractive subtractive color filters. 4,372,649, Cl. 350-162.0SF.
Kempf, Arthur W.: *See*—
Phillips, Richard B.; Kempf, Arthur W.; and Eckert, Robert C., 4,372,812, Cl. 162-40.000.
Kendall Company, The: *See*—
Perlin, Alfred R., 4,372,297, Cl. 128-64.000.
Sergeant, Timothy L., 4,372,310, Cl. 128-284.000.
Villari, Frank K.; and Cianci, James P., 4,372,313, Cl. 128-295.000.
Wichman, Cynthia A., 4,371,986, Cl. 2-051.000.
Kendall, Stanley E., to American Home Products Corporation. Combination scratch filler and primer in aerosol form. 4,372,991, Cl. 427-140.000.
Kermer, Wolf-Dieter: *See*—
Neumann, Peter; Elser, Wolfgang; Bock, Gustav; and Kermer, Wolf-Dieter, 4,373,102, Cl. 544-143.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
von der Decken, Claus-Benedict; Hantke, Hans-Jurgen; and Sturmer, Walter, 4,372,912, Cl. 376-381.000.
Kesselman, David A. Tamper indicator. 4,372,593, Cl. 292-307.00B.
Kiedaisch, Randall A.; and Cooper, Leonard M., to Manville Service Corporation. Crown support beverage carrier. 4,372,599, Cl. 294-87.200.
Kiener, Heinz; Neder, Gunter; and Schurger, Ranier, to SKF Kugellagerfabriken GmbH. Bearing assembly. 4,372,628, Cl. 308-187.100.
Kiessling, Hans-Joachim: *See*—
Wojtech, Bernhard; Kiessling, Hans-Joachim; Becker, Wilhelm; and Hermann, Kurt, 4,373,073, Cl. 525-507.000.
Kiestra, Philippus P.; and Icking, Christian, to Westfalia Separator AG. Volumetric apparatus for milk and method of measuring the total quantity of milk collected from a cow in milking. 4,372,249, Cl. 119-14.170.
Killinger, Karl H.; Johnson, Kenneth M.; and Totino, Peter J., to Singer Company, The. Frame structure for a blindstitch hemming machine. 4,372,234, Cl. 112-258.000.
Kilpatrick, Jerry B.: *See*—
Lane, David; Woodward, Mervin; and Kilpatrick, Jerry B., 4,372,637, Cl. 339-244.00R.
Kim, Kwon S., to Star Manufacturing Co. Prefabricated panel construction system. 4,372,901, Cl. 264-46.500.
Kim, Syng N., to Wico Corporation. Studded mounting structure for switch. 4,373,123, Cl. 200-159.00A.
Kimball, Michael E.; and Randleman, Marvin T., to Goodyear Tire & Rubber Company, The. Curative for a two component isocyanate adhesive and said adhesive. 4,373,082, Cl. 528-60.000.
Kimberly-Clark Corporation: *See*—
Fendler, Eleanor J.; and Bernardin, Leo J., 4,372,312, Cl. 128-290.00R.
Kimura, Kenji: *See*—
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Kimura, Rokusaburo: *See*—
Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, 4,372,319, Cl. 128-421.000.
Kimura, Yoshimasa: *See*—
Tomosada, Masahiro; Kimura, Yoshimasa; and Sakamaki, Hisashi, 4,372,673, Cl. 355-14.00R.
Kincheloe, David W.; and Neathery, David O., to King Instrument Corporation. Flexible tape control apparatus. 4,372,503, Cl. 242-183.000.
King, Allen D., Jr.; King, Robert B.; and Sailers, Earl L., III, to University of Georgia Research Foundation, Inc. Photogeneration of active formate decomposition catalysts to produce hydrogen from formate and water. 4,372,833, Cl. 204-157.10R.
King Instrument Corporation: *See*—
Kincheloe, David W.; and Neathery, David O., 4,372,503, Cl. 242-183.000.
King, Robert B.: *See*—
King, Allen D., Jr.; King, Robert B.; and Sailers, Earl L., III, 4,372,833, Cl. 204-157.10R.
Kings, Donald H. M.; Marckmann, Jean-Claude; and Quang, Pham K., to Rhone-Poulenc Systemes. Process of transferring monocomponent developing powder with a volatile, dielectric liquid. 4,373,016, Cl. 430-126.000.
Kingsdown Medical Consultants Ltd.: *See*—
Steer, Peter L.; and Edwards, John V., 4,372,308, Cl. 128-283.000.
Kinney, Charles W., to GEO Vann, Inc. Well completion method and apparatus. 4,372,384, Cl. 166-278.000.
Kircher, Klaus: *See*—
Menges, George; Kircher, Klaus; and Franzkoch, Bernd, 4,372,898, Cl. 264-22.000.
Kirkendall, Richard D.; Dryadale, William H.; Kokinakis, Louise D.; and Burns, Bruce P., to United States of America, Army. Double ramp discarding sabot. 4,372,217, Cl. 102-521.000.
Kita, Junichiro: *See*—
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, 4,373,107, Cl. 564-473.000.
Kita, Sumio: *See*—
Osaki, Mikio; and Kita, Sumio, 4,373,164, Cl. 346-75.000.
Kitakami, Toshiyuki; and Akiyama, Yoshinori, to Nissan Motor Co., Ltd. Casing for seat-belt retractor. 4,372,613, Cl. 297-481.000.
Kitamori, Nobuyuki; Hemmi, Keizi; and Maeno, Masaya, to Takeda Chemical Industries, Ltd. Granules of sodium ascorbate and the production thereof. 4,372,968, Cl. 424-280.000.
Klauck, Manfred, to Flutec Fluidtechnische Gerate GmbH. Hydraulic pumping and switching apparatus. 4,372,849, Cl. 210-167.000.
Klee, David J.; Lovette, Norris G., Jr.; Ruprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., to Air Products and Chemicals, Inc. Carbon dioxide snow generator with purging means. 4,372,130, Cl. 62-330.000.
Kleeman, Thomas E.: *See*—
Mohan, William L.; Willits, Samuel P.; and Kleeman, Thomas E., 4,373,135, Cl. 377-8.000.
Klein, Max. Polymerization, and corrosion resistance, enhancement by acid addition salts of methacrylic acid and a 2-mono (lower) alkylaminoethyl methacrylate or polymers of these salts. 4,372,913, Cl. 422-16.000.
Klein, Michael D.: *See*—
Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Holzenberger, Kurt, 4,372,337, Cl. 137-240.000.
Kloostra, M. Leon: *See*—
Dehart, Marv L.; Kloostra, M. Leon; and Straub, Harold E., 4,372,170, Cl. 73-861.610.
Knapp, Paul A.; and Major, Frederick A., to Major, Frederick A. Rechargeable transparent slide viewer apparatus. 4,372,068, Cl. 40-367.000.
Knaus, Ernest; Liggett, Paul E.; and Namsick, Raymond J., to Goodyear Aerospace Corporation. Pneumatic lift pad. 4,372,533, Cl. 254-93.0HP.
Knoke, Jurgen; Jost, Manfred; Fahrbach, Erich; and Tecl, Bohuslav, to Carl Freudenberg, Firma. Soft, drapable, nonwoven interlining fabric. 4,373,000, Cl. 428-198.000.
Knostman, Gary J.: *See*—
Ehrlich, Richard A., 4,372,224, Cl. 108-159.000.
Knowles, Susan F., to Bell Telephone Laboratories, Incorporated. Optical fiber cable strain relief assembly. 4,372,511, Cl. 248-68.00R.
Knox, Lloyd C., to Halliburton Company. Method and apparatus for grouting of offshore platform pilings. 4,372,704, Cl. 405-225.000.
Kobayashi, Hideyuki, to Aisin Seiki Kabushiki Kaisha. Brake master cylinder for motor vehicles. 4,372,117, Cl. 60-562.000.
Kobayashi, Kazutsugu: *See*—
Shimamoto, Takeshi; Arai, Kazuo; and Kobayashi, Kazutsugu, 4,372,558, Cl. 273-238.000.
Kobayashi, Masayoshi: *See*—
Hiyama, Yasuhiro; Oshizawa, Hidekazu; Okamoto, Kenji; and Kobayashi, Masayoshi, 4,372,266, Cl. 123-357.000.

Kobe Steel, Ltd.: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.
Kober, Alfred E.: *See*—
Mahoney, Dennis F.; Kober, Alfred E.; and Risbud, Subhash H., 4,372,227, Cl. 110-342.000.
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, to Toyama Chemical Co., Ltd. Treatment of cancer with carcinostatic and immunostimulating agent containing lysophospholipid and phospholipid. 4,372,949, Cl. 424-199.000.
Koehler Manufacturing Company: *See*—
Gulliksen, John E., 4,373,178, Cl. 362-280.000.
Kohayakawa, Yoshimi: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,372,655, Cl. 351-206.000.
Kohler, Eberhard: *See*—
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.
Kojima, Seiichiro: *See*—
Takizawa, Junichi; Kojima, Seiichiro; Satoh, Nobuo; and Nakazato, Eiji, 4,372,578, Cl. 280-802.000.
Kokinakis, Louise D.: *See*—
Kirkendall, Richard D.; Drysdale, William H.; Kokinakis, Louise D.; and Burns, Bruce P., 4,372,217, Cl. 102-521.000.
Kokoku Rubber Industrial Company Limited: *See*—
Kuramochi, Hiroshi; and Toyoda, Ryuichi, 4,372,740, Cl. 425-544.000.
Kolarik, Oldrich, to Mack Trucks, Inc. Apparatus for controlling fuel flow. 4,372,268, Cl. 123-383.000.
Kolter, Gary L. Wire wrap removing tool. 4,372,182, Cl. 81-426.000.
Komiya, Shigeo: *See*—
Tarumi, Niro; Sugimura, Mitsuo; Komiya, Shigeo; and Tsuchiya, Makoto, 4,373,076, Cl. 526-261.000.
Komiya, Yasuo: *See*—
Tomioka, Soichiro; and Komiya, Yasuo, 4,372,486, Cl. 236-92.00B.
Komori Printing Machinery Co., Ltd.: *See*—
Toyoda, Hideaki, 4,372,207, Cl. 101-365.000.
Komoto, Akira; and Tsuji, Tomohiro, to Shimadzu Corporation. Electronic balance. 4,372,406, Cl. 177-212.000.
Komovsky, Vadim R.: *See*—
Sokolov, Sergei S.; Komovsky, Vadim R.; Vlasov, Leonid I.; Boretsky, Boris M.; and Shiryaev, Grigory V., 4,372,121, Cl. 60-606.000.
Konig, Klaus: *See*—
Reichmann, Wolfgang; Konig, Klaus; and Schonfelder, Manfred, 4,373,080, Cl. 528-45.000.
Konishi, Tatsuo: *See*—
Mizukami, Mineo; and Konishi, Tatsuo, 4,373,168, Cl. 358-19.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Masukawa, Toyoaki; Ishikawa, Wataru; Okaniwa, Kenichiro; and Yamashita, Kiyoshi, 4,373,017, Cl. 430-270.000.
Yukawa, Koji; Miyazaki, Masayuki; and Murahashi, Takashi, 4,372,674, Cl. 355-14.00D.
Kono, Tateomi: *See*—
Miyata, Shin; Kono, Tateomi; Shibazaki, Kenji; and Utsunomiya, Yoichi, 4,372,676, Cl. 355-14.00C.
Konopko, Matthew S., to Stone Container Corp. Self-locking protective pads and blank therefor. 4,372,446, Cl. 206-586.000.
Koppers Company, Inc.: *See*—
Ahn, Byung K., 4,372,828, Cl. 204-103.000.
Irwin, Rodney C., 4,372,819, Cl. 202-239.000.
Oberley, William J., 4,373,010, Cl. 428-532.000.
Korbuly, Jozsef: *See*—
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, 4,372,172, Cl. 73-862.390.
Korenberg, Jakob, to York-Shipley, Inc. Fluidized bed reactor utilizing a conical-shaped support and method of operating the reactor. 4,372,228, Cl. 110-347.000.
Koschmieder, Hartumut, to Industriewerk Schaeffler OHG. Recirculating ball bearing. 4,372,623, Cl. 308-6.00C.
Koshugi, Junichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Crosslinked chitin derivatives. 4,373,096, Cl. 536-20.000.
Kossmann, Hans: *See*—
Herdzina, Frank J.; Kossmann, Hans; and Lemke, Harold C., 4,372,720, Cl. 413-56.000.
Kostelnik, Robert J.: *See*—
Dieck, Ronald L.; and Kostelnik, Robert J., 4,373,067, Cl. 525-146.000.
Koster, Robertus J. C.; Six, Volker; and Hale, Peter, to Procter & Gamble Company, The. Detergent composition containing low level of substituted polyamines. 4,372,882, Cl. 252-529.000.
Kovacs, Albert J. Magnetic device for treating hydrocarbon fuels. 4,372,852, Cl. 210-222.000.
Kovacs, Gabor: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Kowalski, Daniel J.; and Ferguson, Douglas J., to Four Star Corporation. Article carrier having variably positionable cross-rail bracket. 4,372,469, Cl. 224-321.000.
Koyama, Shunsaku: *See*—
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, 4,372,883, Cl. 260-112.00R.
Kozponti Banyaszati Fejlesztesi Intezet: *See*—
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, 4,372,172, Cl. 73-862.390.
Kragh, Loren G.: *See*—
Sanderson, William G.; Sumner, Richard B.; and Kragh, Loren G., 4,372,897, Cl. 261-153.000.
Krainhofer, Gunter, to U.S. Philips Corporation. Device for fixing an apparatus in a cut-out of a panel. 4,372,509, Cl. 248-27.100.
Krammer, Robert, deceased (by Krammer, Ruth, legal representative), to Rexnord Inc. Accumulating conveyor. 4,372,441, Cl. 198-781.000.
Krammer, Ruth, legal representative: *See*—
Krammer, Robert, deceased, 4,372,441, Cl. 198-781.000.
Krampe, Geza: *See*—
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, 4,372,172, Cl. 73-862.390.
Krasborn, Gottfried; Roentgen, Paul; Meier, Wilhelm; and Erdweg, Josef, to Saint-Gobain Vitrage. Concealed electric heating element arrangement for vehicle windshields. 4,373,130, Cl. 219-203.000.
Krasovsky, Boris P.; Melnik, Vladimir V.; and Malkin, Daniel D. Instantaneous calender device with spring and tappet mounted on rotary shifter. 4,372,687, Cl. 368-28.000.
Kray, William D.: *See*—
Chung, Rack H.; and Kray, William D., 4,372,835, Cl. 204-159.130.
Kretschmer, Frank F.: *See*—
Lewis, Bernard L.; and Kretschmer, Frank F., 4,373,190, Cl. 364-715.000.
Krings, Josef. Excavation or trenching plate. 4,372,709, Cl. 405-282.000.
Krumwiede, John F.; and Amrhein, Alan G., to PPG Industries, Inc. Melting glass with two stage NO_x control. 4,372,770, Cl. 65-27.000.
Kublanovsky, Lev B.: *See*—
Muraviev, Gennady A.; and Kublanovsky, Lev B., 4,372,151, Cl. 73-40.50A.
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Vapor phase polymerization apparatus for olefins. 4,372,919, Cl. 422-137.000.
Kubota, Ltd.: *See*—
Yamamoto, Ryozo; Yanase, Keiichi; and Oku, Junzo, 4,372,532, Cl. 251-175.000.
Kuckes, Arthur F., to Cornell Research Foundation, Inc. Method of determining the location of a deep-well casing by magnetic field sensing. 4,372,398, Cl. 175-45.000.
Kuhnert, Werner: *See*—
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, 4,372,209, Cl. 101-409.000.
Kulhanek, Emanuel; and Aboussafy, John, to Corod Manufacturing Ltd. Rotary drive assembly for downhole rotary pump. 4,372,379, Cl. 166-68.500.
Kulik, Conrad J.; and Lebowitz, Howard E., to Electric Power Research Institute, Inc. Coal liquefaction process. 4,372,838, Cl. 208-10.000.
Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Zeolite molecular sieve adsorbent for an aqueous system. 4,372,876, Cl. 252-430.000.
Kump, Ernest J. Modular building structures. 4,372,087, Cl. 52-79.120.
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, to Toyo Seikan Kaisha, Ltd. Closure cap having prize markings and peelable liner. 4,372,457, Cl. 215-228.000.
Kuo, Chang-Kiang: *See*—
Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, 4,372,031, Cl. 29-571.000.
Kuramochi, Hiroshi; and Toyoda, Ryuichi, to Kokoku Rubber Industrial Company Limited. Molding apparatus. 4,372,740, Cl. 425-544.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Koshugi, Junichi, 4,373,096, Cl. 536-20.000.
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Chisholm, Douglas R.; and Kurtz, Hobart L., Jr., 4,373,181, Cl. 364-200.000.
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Furukawa, Junji; Furuno, Nobuo; Matsumura, Akira; and Kuwajima, Teruaki, 4,373,074, Cl. 526-92.000.
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Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,372,201, Cl. 100-7.000.
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Petersen, Hans C.; Kyster, Erik; Thomsen, Svend E.; and Flagstad, Carl O., 4,372,413, Cl. 180-152.000.
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Dassler, Karl O.; and Langseder, Neal E., 4,372,462, Cl. 220-269.000.

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Kulik, Conrad J.; and Lebowitz, Howard E., 4,372,838, Cl. 208-10.000.

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Haaf, William R.; Katchman, Arthur; and Lee, Gim F., Jr., 4,373,055, Cl. 524-505.000.

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Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.

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Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, 4,372,878, Cl. 252-455.00Z.

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Helgorsky, Jacques; and Leveque, Alain, 4,372,923, Cl. 423-112.000.

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Lienau, Jeffrey A., to United States of America, Army. First motion detector. 4,372,192, Cl. 89-1.800.

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Collins, David A.; and Lile, Derek L., 4,372,032, Cl. 29-571.000.
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Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.
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Lister, Warren S. Tractor and trailer combination. 4,372,571, Cl. 280-423.00A.
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Ganguly, Ashit K.; Sarre, Olga; and Liu, Yi-Tsung, 4,373,095, Cl. 536-7.100.
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Lobeck, Walter G., Jr.: *See*—
Wu, Yao H.; and Lobeck, Walter G., Jr., 4,372,887, Cl. 548-468.000.
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Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.
Lockheed Corporation: *See*—
Welch, Joseph J.; Grove, William C.; and Moran, Michael E., 4,372,517, Cl. 248-267.000.
Zsolnay, Andrew, 4,373,092, Cl. 528-481.000.
Loctite Corporation: *See*—
Watson, Colin; and Dunn, David J., 4,372,245, Cl. 118-56.000.
Loew, Peter: *See*—
Zink, Rudolf; and Loew, Peter, 4,372,896, Cl. 260-165.000.
Lohrberg, Karl: *See*—
Bielz, Siegfried; Janisch, Paul; and Lohrberg, Karl, 4,372,939, Cl. 423-478.000.
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Loken, Tor: *See*—
Reed, Marion G.; Loken, Tor; and Bryhn, Odd R., 4,372,786, Cl. 106-900.000.
Lombard, Gerard, to Essilor International (Compagnie Generale d'Optique). Blocking apparatus for fixing a metal block to the finished face of a semi-finished spectacle lens blank. 4,372,368, Cl. 164-332.000.
Long, Clyde A., to Sonco Wholesale Fence Inc. Polymer coated chain link fencing. 4,372,992, Cl. 427-185.000.
Look International Enterprises, Inc.: *See*—
Baumann, Jack, 4,372,317, Cl. 128-330.000.
Lopez, Fred T. Precast concrete modular building panel. 4,372,092, Cl. 52-612.000.
Lord Corporation: *See*—
Flower, Wallace C., 4,372,411, Cl. 180-89.150.
Lorenzi, Donald E.: *See*—
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,372,658, Cl. 354-63.000.
Lovable Company, The: *See*—
Robinson, Earl, 4,372,321, Cl. 128-463.000.
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Loveland, Robert S., to Perkin-Elmer Corporation, The. Flowmeter system with improved loop gain. 4,372,167, Cl. 73-861.280.
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Klee, David J.; Lovette, Norris G., Jr.; Ruprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., 4,372,130, Cl. 62-330.000.
Lowry, Edward E., Jr. Floating fish feeder. 4,372,252, Cl. 119-51.00R.
Lu, Wei C., to Eastman Kodak Company. Apparatus for flash fusing toner images. 4,373,131, Cl. 219-216.000.
Lubeck, Hermann: *See*—
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,372,201, Cl. 100-7.000.
Lucas, Eugene F.: *See*—
Anderson, David H.; and Lucas, Eugene F., 4,372,414, Cl. 180-165.000.
Lucas Industries Limited: *See*—
Adams, Graham L., 4,372,267, Cl. 123-366.000.
Luczak, Francis J.: *See*—
Landsman, Douglas A.; and Luczak, Francis J., 4,373,014, Cl. 429-13.000.
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Luebkemann, Leroy: *See*—
Loken, Arlin D.; and Luebkemann, Leroy, 4,372,410, Cl. 180-89.120.
Luiten, Cornelius H.: *See*—
Gohring, Werner; and Luiten, Cornelius H., 4,372,790, Cl. 148-16.500.
Lukenbach, Elvin R.: *See*—
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., 4,372,869, Cl. 252-174.160.
Lundberg, Hans G., to Marinkonsult Hans Lundberg AG. Assembly for treating vessel hulls. 4,372,242, Cl. 114-222.000.
Lutelec Luchaire Equipement: *See*—
Sandillon, Bernard, 4,372,140, Cl. 72-53.000.
Lutz, Michael A., to Raychem Corporation. Temperature excursion sensing and locating apparatus. 4,372,693, Cl. 374-111.000.
Lutz, Theodore A. Material-handling apparatus. 4,372,726, Cl. 414-517.000.
Luxon, Bruce A.: *See*—
Abolins, Visvaldis; and Luxon, Bruce A., 4,373,052, Cl. 524-451.000.
Lynch, Donald M.: *See*—
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,372,977, Cl. 424-342.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Herzan, Georg; and Simeth, Claus, 4,372,204, Cl. 101-145.000.
Pflaum, August, 4,372,205, Cl. 101-153.000.
Rebel, Herbert, 4,372,244, Cl. 118-46.000.
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Adams, Richard R.; MacConochie, Ian O.; and Poole, Bordie D., Jr., 4,372,680, Cl. 356-51.000.
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Bailey, Curtis R., 4,372,039, Cl. 29-734.000.
Mack Trucks, Inc.: *See*—
Kolarik, Oldrich, 4,372,268, Cl. 123-383.000.
Madelin, Bertrand. Process for recovery of metals contained in plombiferous and/or zinciferous oxide compounds. 4,372,780, Cl. 75-14.000.
Madonia, Ciro: *See*—
Hatzikelis, Christopher; Madonia, Ciro; and Cosentino, Cesare C., 4,372,083, Cl. 49-462.000.
Maeno, Masaya: *See*—
Kitamori, Nobuyuki; Hemmi, Keizi; and Maeno, Masaya, 4,372,968, Cl. 424-280.000.
Maggi, Carlo A.: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., 4,372,958, Cl. 424-253.000.
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O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,372,658, Cl. 354-63.000.
Magnetic Peripherals Inc.: *See*—
Wickham, Thomas J., 4,372,040, Cl. 29-741.000.
Magyar, Karoly: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,373,100, Cl. 542-439.000.
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Maier, H. Armin, to Gowin-Card, Inc.; and Tuftco Corporation. Carpet dyeing system with movable squeegee roll. 4,372,001, Cl. 8-151.000.
Major, Frederick A.: *See*—
Knapp, Paul A.; and Major, Frederick A., 4,372,068, Cl. 40-367.000.
Maklad, Mokhtar S., to EOTec Corporation. Method of manufacturing optical fibers. 4,372,767, Cl. 65-3.120.
Malachowski, Michael A.; Shur, Victor; and Thettu, Raghulinga R., to Xerox Corporation. Sheet registration actuation. 4,372,668, Cl. 355-3.00R.
Maliszewski, Theodore V., to Combustion Engineering, Inc. Electronic controller of hydraulic pressure for journal loading of bowl mill. 4,372,496, Cl. 241-37.000.
Malkin, Daniel D.: *See*—
Krasovsky, Boris P.; Melnik, Vladimir V.; and Malkin, Daniel D., 4,372,687, Cl. 368-28.000.
Manders, Logan J. Oil filter apparatus. 4,372,848, Cl. 210-90.000.
Mandle, Richard M.; and Wong, Yuan N., to Electro-Nucleonics, Inc. Chemical luminescence amplification substrate system for immunochemistry involving microencapsulated fluorescer. 4,372,745, Cl. 436-537.000.

Mandt, Mikkel G., to Clevepak Corporation. Multi stage flocculation treatment system. 4,372,851, Cl. 210-199.000.
Mann, Adriaan B., to Goudsche Machinefabriek B.V. Pipe clamp and a probing device comprising a pipe clamp. 4,372,153, Cl. 73-84.000.
Mansfield Carbon Products, Inc.: *See*—
Whitten, Charles M.; Scott, Robert H.; and Mansfield, Vaughn, 4,372,756, Cl. 48-202.000.
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Whitten, Charles M.; Scott, Robert H.; and Mansfield, Vaughn, 4,372,756, Cl. 48-202.000.
Manville Service Corporation: *See*—
Kiedaisch, Randall A.; and Cooper, Leonard M., 4,372,599, Cl. 294-87.200.
Manzione, Louis T.: *See*—
Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., 4,372,834, Cl. 204-157.10R.
Marcatili, Enrique A.: *See*—
Liu, Pao-Lo P.; and Marcatili, Enrique A., 4,372,643, Cl. 350-96.140.
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LaViolette, Paul A.; Caccioli, Anthony; Garcia, Alexander; Hotchkiss, Earl H.; and Marchitto, Alfred J., Jr., 4,372,016, Cl. 24-241.0PS.
Marckmann, Jean-Claude: *See*—
Kings, Donald H. M.; Marckmann, Jean-Claude; and Quang, Pham K., 4,373,016, Cl. 430-126.000.
Marconi Company Limited: *See*—
Cooper, David, 4,373,160, Cl. 343-100.0SA.
Marinkonsult Hans Lundberg AG: *See*—
Lundberg, Hans G., 4,372,242, Cl. 114-222.000.
Markert, Gerhard: *See*—
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.
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Marks, Mortimer: *See*—
Marks, Alvin M.; and Marks, Mortimer, 4,372,656, Cl. 352-57.000.
Marpac Industries, Inc.: *See*—
Pritchitt, Frederick J., 4,372,467, Cl. 222-501.000.
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Raksanyi, William; and Marsh, Ronald W., 4,372,604, Cl. 297-162.000.
Marshall, John P.; and Ruffer, Dennis A., to Allen Group Inc. Matrix method and apparatus for engine analysis. 4,373,186, Cl. 364-551.000.
Martin, Richard T., to Applied Magnetics-Magnetic Head Division Corporation. Apparatus for accurately registering a member and a substrate in an interdependent relationship. 4,372,248, Cl. 118-720.000.
Martin, Robert A.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,372,112, Cl. 60-323.000.
Marton, Renata; and Brown, Alton F., to Buffalo Color Corporation. Process and apparatus for comminuting using abrasive discs in a disc refiner. 4,372,495, Cl. 241-28.000.
Marttinen, Toivo, to Enso-Gutzeit Osakeyhtio . Dispensing means for sapling control substance connected with a land clearing saw. 4,372,047, Cl. 30-123.300.
Maruyama, Shigeo: *See*—
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, 4,372,655, Cl. 351-206.000.
Marx, Thomas O., to Atwood Vacuum Machine Co. Pneumatic spring with protective boot. 4,372,429, Cl. 188-322.120.
Maskwa, Alvin J.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Mason, Edwin W., to Mason Keller Corporation. Method of making an applicator package. 4,372,098, Cl. 53-412.000.
Mason Keller Corporation: *See*—
Mason, Edwin W., 4,372,098, Cl. 53-412.000.
Massachusetts General Hospital, The: *See*—
Strauss, Harry W.; Callahan, Ronald J.; and Froelich, Jerry W., 4,372,294, Cl. 128-1.100.
Massachusetts Institute of Technology: *See*—
Flemings, Merton C.; and Matsuniya, Tooru, 4,372,369, Cl. 164-482.000.
Guditz, Elis A.; and Burke, Robert L., 4,372,996, Cl. 427-328.000.
Hsieh, Jaw J., 4,372,791, Cl. 148-171.000.
Langer, Robert S.; Linhardt, Robert; Cooney, Charles L.; Galliher, Parrish M.; Flanagan, Margaret M.; and Klein, Michael D., 4,373,023, Cl. 435-2.000.
Mast, Burton T. Compressor station for arctic gas pipeline. 4,372,332, Cl. 137-1.000.
Master Modular Homes, Inc.: *See*—
del Valle, Jaime L., 4,372,906, Cl. 264-256.000.
Masukawa, Toyoaki; Ishikawa, Wataru; Okaniwa, Kenichiro; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Photosensitive compound and photosensitive material containing it. 4,373,017, Cl. 430-270.000.
Material Sciences Corporation: *See*—
Rausch, John J.; and Van Thyne, Ray J., 4,372,995, Cl. 427-300.000.
Mathews, Lester R., to Mathews, Lester R.; Warner, Lucien; and Water Circulation Patents, Inc. Rotational indexing nozzle arrangement. 4,371,994, Cl. 4-490.000.
Mathia, Tadeusz G.: *See*—
Bo, Ermano; and Mathia, Tadeusz G., 4,372,781, Cl. 75-65.0ZM.
Matsumura, Akira, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Doppler radar mounting structure for motor vehicles. 4,373,161, Cl. 343-717.000.
Matsumura, Akira: *See*—
Furukawa, Junji; Furuno, Nobuo; Matsumura, Akira; and Kuwajima, Teruaki, 4,373,074, Cl. 526-92.000.
Matsumura, Isao; Ishikawa, Yasuyuki; Maruyama, Shigeo; Hirano, Reiji; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Automatic eye-refractometer. 4,372,655, Cl. 351-206.000.
Matsunaga, Kenichi: *See*—
Yoshikuni, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohbara, Minoru, 4,372,948, Cl. 424-180.000.
Matsuniya, Tooru: *See*—
Flemings, Merton C.; and Matsuniya, Tooru, 4,372,369, Cl. 164-482.000.
Matsuo, Hisayasu: *See*—
Watanabe, Yutaka; and Matsuo, Hisayasu, 4,373,019, Cl. 430-317.000.
Matsuo, Katsuharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Washing machine. 4,372,134, Cl. 68-12.00R.
Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Passive seat belt arrangement for a vehicle. 4,372,579, Cl. 280-802.000.
Matsushima, Akira. Driving device for a print head of a printer. 4,372,698, Cl. 400-320.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Shimamoto, Takeshi; Arai, Kazuo; and Kobayashi, Karutsugu, 4,372,558, Cl. 273-238.000.
Matsushita Electric Works, Ltd.: *See*—
Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, 4,372,319, Cl. 128-421.000.
Matsuzawa, Yasue: *See*—
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,373,094, Cl. 536-6.400.
Mattel, Inc.: *See*—
Del Principe, Robert M.; and Reichert, David A., 4,372,557, Cl. 273-88.000.
Minkoff, Michael D.; and Chang, Richard S., 4,372,556, Cl. 273-85.00G.
Matthews, William G.; Sicard, Jean-Paul; and Anderson, Richard A., to Union Carbide Corporation. Liquid adsorption process and apparatus. 4,372,857, Cl. 210-673.000.
Mattson, Roy D. Adjustable firmness cushion with multiple layered foam-filled compartments. 4,371,997, Cl. 5-450.000.
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the production of vaccine. 4,372,883, Cl. 260-112.00R.
Matweyou, Stephen: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,372,801, Cl. 156-434.000.
Mauer, Michael G., Jr.: *See*—
Giordano, Anthony P.; and Mauer, Michael G., Jr., 4,372,145, Cl. 72-387.000.
Maurice Goodall (Holdings) Limited: *See*—
Goodall, Maurice, 4,372,570, Cl. 280-154.50R.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Ulrich, Reinhard, 4,372,685, Cl. 356-350.000.
Maxon Corporation: *See*—
Rollins, M. Jack; and Coppin, William P., 4,372,531, Cl. 251-174.000.
Mayfield, Glenn L., to United States of America, Energy. Removable, hermetically-sealing, filter attachment system for hostile environments. 4,372,853, Cl. 210-232.000.
Maylahn, Donald J.: *See*—
Drennan, Denis B.; Maylahn, Donald J.; and Schleicher, Thomas R., 4,372,300, Cl. 128-83.000.
Mayse, Weldon D.: *See*—
Watson, Frederick D.; Mayse, Weldon D.; and Franse, Albert D., 4,372,837, Cl. 204-186.000.
Mazur, Joseph S., to Eaton Corporation. Cross-flow fan for transverse engine vehicle. 4,372,409, Cl. 180-54.00A.
McBee, Leroy D.: *See*—
Bennett, Benjamin R.; McBee, Leroy D.; and Horak, Richard F., 4,372,129, Cl. 62-175.000.
McCabe, Francis J. Balancing damper with quick set adjustment bracket. 4,372,342, Cl. 137-601.000.
McCabe, Francis J. Thermally activated, automatic damper and damper operator. 4,372,485, Cl. 236-1.00G.
McCarthy, James R. Reagent for froth flotation of bituminous coal. 4,372,864, Cl. 252-61.000.
McCarthy, Shaun L.; and Lambe, John J., to Ford Motor Company. Thin film electroluminescent device. 4,373,145, Cl. 313-503.000.
McCartney, Billy R. Ice making container apparatus. 4,372,523, Cl. 249-79.000.
McClintock, Walter O.: *See*—
Lawver, James E.; McClintock, Walter O.; and Snow, Robert E., 4,372,843, Cl. 209-12.000.
McClure, B. W.: *See*—
Shannon, James A.; and McClure, B. W., 4,372,284, Cl. 124-78.000.
McColl, Bruce J., to Owens-Illinois, Inc. Independent steering and propulsion system for off road vehicle. 4,372,407, Cl. 180-6.200.

McCord, Lawless D., to Independent Transfer Equipment Co. Transfer hoist for disabled persons. 4,372,452, Cl. 212-139.000.

McCorquodale Machine Systems Limited: *See*—
Holdsworth, Alan S., 4,372,473, Cl. 227-3.000.

McCullough, Glenn R., to Shell Oil Company. Sulfur oxides removal. 4,372,927, Cl. 423-244.000.

McDonald, Gerald F., to TII Industries Inc. Line test termination device. 4,373,120, Cl. 179-175.000.

McDuffie, James W.: *See*—
McIlwain, Irwin D.; and McDuffie, James W., 4,372,103, Cl. 56-14.400.

MCF Footwear Corporation: *See*—
Adamik, Jaroslav F., 4,372,060, Cl. 36-54.000.

McGhie, Joseph A.: *See*—
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,373,108, Cl. 568-817.000.

McGuerty, Jay S. Saxophone mouthpiece having reed adjustment means. 4,372,190, Cl. 84-383.00R.

McGuire-Nicholas Manufacturing Company: *See*—
Harvey, Robert P., 4,372,468, Cl. 224-268.000.

McIlwain, Irwin D.; and McDuffie, James W., to Sperry Corporation. Combine drive belt shielding. 4,372,103, Cl. 56-14.400.

McKay, Garry M.: *See*—
Gibson, David V.; McKay, Garry M.; and Swalwell, John E., 4,373,054, Cl. 524-460.000.

McKee, Arnold D.: *See*—
Simonds, Gary; and McKee, Arnold D., 4,372,285, Cl. 124-90.000.

McMillen, Bobby E., to AMBAC Industries, Incorporated. Method for making an electric motor housing with integral pole. 4,372,035, Cl. 29-596.000.

McMillen, James M., to Mobil Oil Corporation. Method for recovery of oil from tilted reservoirs. 4,372,381, Cl. 166-263.000.

McWilliams, Rose M. Method and apparatus for enumerative display and disposal of surgical sponges. 4,372,102, Cl. 53-474.000.

Mead Corporation, The: *See*—
Leib, Russel W., Jr., 4,372,600, Cl. 294-87.200.
Lewis, Edwin B.; and Moore, Roy N., Jr., 4,372,152, Cl. 73-81.000.

Mead Johnson & Company: *See*—
Wu, Yao H.; and Lobeck, Walter G., Jr., 4,372,887, Cl. 548-468.000.

Means, Rodney J.; Plunkett, Galen P., Jr, Galen P.; Dennis, Charles A.; and Moon, John L., to International Business Machines Corporation. Bus interface units sharing a common bus using distributed control for allocation of the bus. 4,373,183, Cl. 364-200.000.

Mechanical Technology Incorporated: *See*—
Dineen, John J., 4,372,116, Cl. 60-525.000.
Rauch, Jeffrey S., 4,372,115, Cl. 60-520.000.

Meeks, Thomas: *See*—
Rhoades, Craig A.; and Meeks, Thomas, 4,372,386, Cl. 166-300.000.

Mehus, Richard J., to Economics Laboratory, Inc. Fail-safe valve. 4,372,345, Cl. 137-636.000.

Meier, Wilhelm: *See*—
Krasborn, Gottfried; Roentgen, Paul; Meier, Wilhelm; and Erdweg, Josef, 4,373,130, Cl. 219-203.000.

Meininger, Fritz: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,372,892, Cl. 260-458.00C.

Meismer, Richard A., to Caterpillar Tractor Co. Method and apparatus for determining cylinder liner projection. 4,372,156, Cl. 73-119.00R.

Mekosh, George, Jr., to Budd Company, The. Anti-locking brake system for a vehicle. 4,372,620, Cl. 303-99.000.

Meli, Alberto: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., 4,372,958, Cl. 424-253.000.

Melnik, Vladimir V.: *See*—
Krasovsky, Boris P.; Melnik, Vladimir V.; and Malkin, Daniel D., 4,372,687, Cl. 368-28.000.

Memering, Leroy J., to National Distillers & Chemical Corp. Polyvinyl chloride containing vinyl acetate-ethylene copolymer as impact strength modifier. 4,373,051, Cl. 524-427.000.

Menasha Corporation: *See*—
Le Grand, Alexander J.; and Barnhouse, Richard A., 4,372,444, Cl. 206-505.000.

Menges, George; Kircher, Klaus; and Franzkoch, Bernd, to Paul Troester Maschinenfabrik. Process of crosslinking electrical insulators of plastic or rubber. 4,372,898, Cl. 264-22.000.

Mennicken, Gerhard: *See*—
Nachtkamp, Klaus; Bock, Manfred; Mennicken, Gerhard; and Pedain, Josef, 4,373,081, Cl. 528-45.000.

Menzel, Guenther, to Siemens Aktiengesellschaft. Process for producing coarse-grain crystalline/mono-crystalline metal and alloy films. 4,372,989, Cl. 427-53.100.

Merck & Co., Inc.: *See*—
Christensen, Burton G.; and Shih, David H., 4,372,965, Cl. 424-274.000.
Yin, Robert I., 4,373,011, Cl. 428-537.000.

Merrill Manufacturing Company: *See*—
Anderson, Stephen J., 4,372,339, Cl. 137-288.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Brunsch, Klaus; Herkert, Claus-Michael; and Thomamueller, Dieter, 4,372,795, Cl. 156-155.000.

Mesta Machine Company: *See*—
Petros, Andrew J., 4,372,625, Cl. 384-129.000.
Petros, Andrew J., 4,372,626, Cl. 384-129.000.

Metacon AG: *See*—
Dur, Bernhard, 4,372,537, Cl. 266-45.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Bielz, Siegfried; Janisch, Paul; and Lohrberg, Karl, 4,372,939, Cl. 423-478.000.

Metallwerk Max Brose GmbH & Co.: *See*—
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, 4,372,521, Cl. 248-430.000.

Meyer, Franz J.: *See*—
Dengler, Robert; and Meyer, Franz J., 4,373,171, Cl. 360-71.000.

Michael, Farid Y. Surface ship having improved speed and maneuverability. 4,372,240, Cl. 114-56.000.

Michel, Gudrun: *See*—
Seipp, Ulrich; Vollenberg, Werner; Mueller, Bernd; and Michel, Gudrun, 4,372,971, Cl. 424-285.000.

Mickelson, Thorwald J., to Transportation Security Inc. Lock protecting hasp. 4,372,136, Cl. 70-14.000.

Micro-Plate, Inc.: *See*—
Eidschun, Charles D., 4,372,825, Cl. 204-27.000.

Miedema, Hotze: *See*—
Karabinis, Peter D.; and Miedema, Hotze, 4,373,210, Cl. 455-273.000.

Miles, Peter D.: *See*—
Durant, Graham J.; and Miles, Peter D., 4,372,963, Cl. 424-272.000.

Miller, Donald E., to Continental Group, Inc., The. Press motion dampener. 4,372,146, Cl. 72-453.130.

Miller, Franklyn D.: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,372,822, Cl. 203-19.000.

Miller, Gerald D., to Air Products and Chemicals, Inc. Flushable towelette. 4,372,447, Cl. 206-812.000.

Miller, Harold M., to American Optical Corporation. Contact lens sterilizing apparatus. 4,372,917, Cl. 422-116.000.

Miller, Harold N., to Exxon Research & Engineering Co. Oil-soluble metal containing sulfonated polymers useful as oil additives. 4,372,862, Cl. 252-33.000.

Miller, Jack E., to Big Inch Marine Systems, Inc. Coupling for coupling tubular elements. 4,372,584, Cl. 285-18.000.

Miller, John P. K., IV; and Breazeale, Benjamin T., II. Combined casket and burial vault assembly with stackable components. 4,372,018, Cl. 27-35.000.

Miller, Robert A.; Larson, Kenneth W.; and Schopen, Joseph L., to Baxter Travenol Laboratories, Inc. Process and apparatus for compounding hyperalimentation solutions. 4,372,100, Cl. 53-428.000.

Miller, Stewart E., to Bell Telephone Laboratories, Incorporated. Optical fiber with enhanced mode coupling. 4,372,645, Cl. 350-96.300.

Mills, David A.; and Turner, Norris G., to E-Systems, Inc. Tracking in a distribution system. 4,373,185, Cl. 364-478.000.

Minigrip, Inc.: *See*—
Herz, Andre M., 4,372,793, Cl. 156-66.000.

Minkoff, Michael D.; and Chang, Richard S., to Mattel, Inc. Electronic soccer game. 4,372,556, Cl. 273-85.00G.

Minnesota Mining and Manufacturing Company: *See*—
Boeder, Charles W., 4,373,077, Cl. 526-309.000.
Brochman, Wilfred R.; Hannula, Rodney R.; and Jorgensen, Bradley H., 4,372,460, Cl. 220-258.000.
Fritze, Gary D.; and Graham, Joseph, 4,372,997, Cl. 428-144.000.
Geisler, Thomas C., 4,372,582, Cl. 282-27.500.
Haskett, Thomas E.; and Schmitt, Joseph J., 4,373,127, Cl. 219-69.00E.
Kellie, Truman F., 4,372,649, Cl. 350-162.0SF.
Winslow, John M., 4,373,020, Cl. 430-339.000.

Minolta Camera Co., Ltd.: *See*—
Miyata, Shin; Kono, Tateomi; Shibazaki, Kenji; and Utsunomiya, Yoichi, 4,372,676, Cl. 355-14.00C.

Minot, Etienne: *See*—
Naturel, Christian; and Minot, Etienne, 4,372,494, Cl. 239-553.300.

Misiorny, Alfons: *See*—
Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, 4,372,894, Cl. 260-941.000.

Misura, John T.: *See*—
Champlin, Charles L.; Misura, John T.; and Reiser, Carl J., 4,372,763, Cl. 55-501.000.

Mitchell, John A.: *See*—
Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,372,980, Cl. 426-231.000.

Mitchell, Robert K.; and Catterson, Robert K., to Briggs & Stratton Corporation. Combination clutch/brake mechanism. 4,372,433, Cl. 192-18.00R.

Mitchell, Terry L.; and Russell, Robert L. Tilt-out box for mail and the like. 4,372,480, Cl. 232-28.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kato, Masaru, 4,372,783, Cl. 75-246.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Ikeguchi, Nobuyuki, 4,373,086, Cl. 528-322.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Yoshizumi, Motohiko, 4,373,013, Cl. 428-570.000.

Mitsuhashi, Masakazu: *See*—
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, 4,372,883, Cl. 260-112.00R.

Miya, Tetsuo: *See*—
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,372,647, Cl. 350-96.330.

Miyata, Shin; Kono, Tateomi; Shibazaki, Kenji; and Utsunomiya, Yoichi, to Minolta Camera Co., Ltd. Electrophotographic copying machine. 4,372,676, Cl. 355-14.00C.

Miyatake, Takashi: *See*—
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, 4,373,107, Cl. 564-473.000.
Miyazaki, Masayuki: *See*—
Yukawa, Koji; Miyazaki, Masayuki; and Murahashi, Takashi, 4,372,674, Cl. 355-14.00D.
Miyazaki, Yasunosuke: *See*—
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,372,919, Cl. 422-137.000.
Miyoshi, Mituji: *See*—
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,372,919, Cl. 422-137.000.
Mizota, Yasuhiro, to Nippon Electric Co., Ltd. Radio subscriber system with efficient use of radio frequency carrier waves. 4,373,205, Cl. 455-86.000.
Mizukami, Mineo; and Konishi, Tatsuo, to Nippon Electric Co., Ltd. Digital time-base corrector having a wide correction range. 4,373,168, Cl. 358-19.000.
Mizuma, Kenichi: *See*—
Yanagawa, Nobuyuki; and Mizuma, Kenichi, 4,372,547, Cl. 271-10.000.
Mizuno, Akira, to Nikko Kogyo Kabushiki Kaisha. Cable holder. 4,373,112, Cl. 174-65.00R.
Mizushima, Sadao: *See*—
Tsuchiya, Toshio; Enokimoto, Akito; Mizushima, Sadao; and Takano, Suwaji, 4,372,602, Cl. 296-78.00R.
Mizushima, Yoichi; and Hosonaga, Taketoshi, to Nissan Motor Co., Ltd. Forwardly inclining seat. 4,372,607, Cl. 297-325.000.
Mo och Domsjo Aktiebolag: *See*—
Samuelson, Hans O.; and Abrahamsson, Kjell E., 4,372,811, Cl. 162-38.000.
Mobil Oil Corporation: *See*—
McMillen, James M., 4,372,381, Cl. 166-263.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,372,839, Cl. 208-59.000.
Paul, James M.; and Espenscheid, Wilton F., 4,372,616, Cl. 299-5.000.
Mocquet, Gisele C.: *See*—
Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,372,967, Cl. 424-279.000.
Modrovich, Ivan E. Stabilization of hydrolysis prone labile organic reagents in liquid media. 4,372,874, Cl. 436-176.000.
Moffitt, Merritt L., Jr. Suction pump reservoir brush. 4,372,700, Cl. 401-157.000.
Mohan, William L.; Willits, Samuel P.; and Kleeman, Thomas E., to Spartanics, Ltd. Pitch matching detecting and counting system. 4,373,135, Cl. 377-8.000.
Molineus, Tilman: *See*—
Schumacher, Hermann; Molineus, Tilman; and Ridder, Detlef, 4,372,581, Cl. 282-27.500.
Molins Limited: *See*—
Dowding, John G.; Turner, Peter R.; and Hudson, Robert J., 4,373,188, Cl. 364-552.000.
Dyett, Derek H.; and Thorp, Neil, 4,372,327, Cl. 131-95.000.
Molisani, Justin J.: *See*—
Cook, Sanford L.; Molisani, Justin J.; and Dennison, Kenneth I., Jr., 4,372,591, Cl. 292-221.000.
Monarch Marking Systems, Inc.: *See*—
Pou, Frederick M., 4,372,696, Cl. 400-124.000.
Monsanto Company: *See*—
LeClair, Francis J.; and Surgant, John M., 4,372,777, Cl. 71-93.000.
Montedison S.p.A.: *See*—
Gratani, Francesco; Nelli, Giuseppe; Di Battista, Piero; and Cicchetti, Osvaldo, 4,373,042, Cl. 524-100.000.
Montgomery, James W.: *See*—
Baugh, John L.; Montgomery, James W.; and Roach, Malcolm B., 4,372,390, Cl. 166-373.000.
Moon, John L.: *See*—
Means, Rodney J.; Plunkett, Galen P., Jr, Galen P.; Dennis, Charles A.; and Moon, John L., 4,373,183, Cl. 364-200.000.
Moore, Albert R., to Burger King Corporation. Condiment dispenser. 4,372,354, Cl. 141-361.000.
Moore & Hanks Co.: *See*—
Bennett, Benjamin R.; McBee, Leroy D.; and Horak, Richard F., 4,372,129, Cl. 62-175.000.
Moore, Michael J.; and Studley, Charles F., Jr., to Good Earth Growers, Inc. Multi-wheeled transporter and conveying vehicle. 4,372,725, Cl. 414-460.000.
Moore, Roy N., Jr.: *See*—
Lewis, Edwin B.; and Moore, Roy N., Jr., 4,372,152, Cl. 73-81.000.
Moran, Michael E.: *See*—
Welch, Joseph J.; Grove, William C.; and Moran, Michael E., 4,372,517, Cl. 248-267.000.
Moraw, Klaus; and Paul, Hans-Gunther, to Rutgerswerke Aktiengesellschaft. Asbestos-free friction material. 4,373,038, Cl. 523-156.000.
Moreau, Pierre D.; and Jonsson, Nils A. Moroxydine phenoxyisobutyrates and method of use. 4,372,954, Cl. 424-248.530.
Morgan, Steven R.; and Carlson, Linda A., to Volleyball World, Inc. Volleyball practice apparatus. 4,372,561, Cl. 273-411.000.
Mori, Fumio: *See*—
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,372,457, Cl. 215-228.000.
Morikawa, Shinsuke: *See*—
Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, 4,372,938, Cl. 423-469.000.
Morinaka, Akira: *See*—
Asano, Yoshihiro; Morinaka, Akira; and Murase, Kei, 4,373,004, Cl. 428-328.000.
Morita, Katsuhiko: *See*—
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.
Morita, Yousuke: *See*—
Hagiwara, Miyuki; and Morita, Yousuke, 4,373,046, Cl. 524-285.000.
Morris, James F., to United States of America, National Aeronautics and Space Administration. Heat pipes containing alkali metal working fluid. 4,372,377, Cl. 165-104.260.
Morris, James F., to United States of America, National Aeronautics and Space Administration. Thermionic energy converters. 4,373,142, Cl. 310-306.000.
Morris, Jesse L.: *See*—
Sugalski, Raymond K.; Leduc, Kenneth C.; and Morris, Jesse L., 4,373,129, Cl. 219-79.000.
Morrison, Jon R. Process and system for anaerobic treatment of waste. 4,372,856, Cl. 210-603.000.
Morse, Randall L., to Trafcon, Inc. Traffic barricade. 4,372,536, Cl. 256-64.000.
Morton, James W., to General Electric Company. Apparatus for providing an electrical coil with leads. 4,372,029, Cl. 29-564.400.
Mosing, Donald E. Method and apparatus for connecting and disconnecting tubular members. 4,372,026, Cl. 29-426.500.
Motonami, Masanao; Ogawa, Hisashi; and Imai, Yoshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic seatbelt system. 4,372,580, Cl. 280-802.000.
Motorola, Inc.: *See*—
Beesley, Graham E., 4,373,139, Cl. 307-350.000.
Feder, Alvin, 4,373,119, Cl. 179-110.00A.
Fette, Bruce A.; Harte, Bruce D.; and Tennyson, Bill E., 4,373,191, Cl. 364-724.000.
Motoyama, Kazuyasu; and Nakao, Toshihiro, to Olympus Optical Co., Ltd. Tape recorder. 4,373,172, Cl. 360-105.000.
Mouri, Yasunori: *See*—
Ishii, Toshio; Mouri, Yasunori; Abe, Osamu; and Hasegawa, Taiji, 4,373,187, Cl. 364-431.060.
Mouzin, Gilbert; Cousse, Henri; Stenger, Antoine; and Casadio, Sylvano, to Pierre Fabre SA. Substituted 2-benzoyl-4-chloroglycinanilide derivatives, a process for their production, and their use as medicaments. 4,372,975, Cl. 424-324.000.
Muchnik, Shimon: *See*—
Kaganovsy, Yaacov; Kustanovich, Yosef; Shmuter, Shimshon; Gelfer, Vadim; and Muchnik, Shimon, 4,372,818, Cl. 202-83.000.
Mueller, Bernd: *See*—
Seipp, Ulrich; Vollenberg, Werner; Mueller, Bernd; and Michel, Gudrun, 4,372,971, Cl. 424-285.000.
Mueller, William A.; Ingham, John D.; and Reilly, William W., to United States of America, National Aeronautics and Space Administration. Elastomer coated fillers and composites thereof comprising at least 60% by wt. of a hydrated filler and an elastomer containing an acid substituent. 4,373,039, Cl. 523-205.000.
Muetterties, Andrew J.: *See*—
Genese, Joseph N.; and Muetterties, Andrew J., 4,372,306, Cl. 128-214.00G.
Mullane, John C., Jr.: *See*—
Klee, David J.; Lovette, Norris G., Jr.; Ruprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., 4,372,130, Cl. 62-330.000.
Muller, Jakob, to Textilma AG. Pusher needle. 4,372,133, Cl. 66-120.000.
Muller, Werner C.; and Miller, Franklyn D., to National Distillers & Chemical Corp. Production of anhydrous ethanol. 4,372,822, Cl. 203-19.000.
Murahashi, Takashi: *See*—
Yukawa, Koji; Miyazaki, Masayuki; and Murahashi, Takashi, 4,372,674, Cl. 355-14.00D.
Murakami Kaimeido Co., Ltd.: *See*—
Yamana, Toru, 4,372,177, Cl. 74-501.00M.
Murakami, Kunio, to Enshu Limited. Tool transfer arm assembly for automatic milling machines. 4,372,728, Cl. 414-590.000.
Murase, Kei: *See*—
Asano, Yoshihiro; Morinaka, Akira; and Murase, Kei, 4,373,004, Cl. 428-328.000.
Muraviev, Gennady A.; and Kublanovsky, Lev B. Automatic fault locating apparatus for a pressurized pipeline. 4,372,151, Cl. 73-40.50A.
Muroi, Masayuki: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,373,028, Cl. 435-253.000.
Murphy, Michael. Auxiliary scaffolding attachment. 4,372,425, Cl. 182-179.000.
Murphy, William L.: *See*—
Haasl, Michael J.; Snider, Kenneth D.; and Murphy, William L., 4,372,982, Cl. 426-549.000.
Musillo, Robert. Earring with latch member. 4,372,131, Cl. 63-12.000.
Myerly, R. S.: *See*—
Brown, Leo F.; and Myerly, R. S., 4,372,199, Cl. 99-341.000.
Myers, John L.; Benscoter, Richard D.; Chambers, Bruce B.; and Dyar, Ralph E., to Butler Manufacturing Company. Service poles. 4,373,111, Cl. 174-48.000.

Myers, John W., to Hemco Wire Products, Inc. Wire tree baskets and a method and apparatus for forming same. 4,372,351, Cl. 140-112.000.

Mykkanen, C. Fred, to Honeywell Inc. Apparatus to dissipate static electricity. 4,373,175, Cl. 361-220.000.

N-S-W Corporation: *See—*
Tinsley, James M., 4,372,181, Cl. 81-57.390.

Naaktgeboren, Adrianus: *See—*
De Coene, Frans J. G. C.; Naaktgeboren, Adrianus; and Vansteelant, Marc G., 4,372,723, Cl. 414-111.000.

Nachtkamp, Klaus; Bock, Manfred; Mennicken, Gerhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Coating compositions and process for the production of polyurethane coatings. 4,373,081, Cl. 528-45.000.

Naevestad, Roy, to Wilputte Corporation. Chuck door for coke oven pusher side door and heat radiation shield. 4,372,820, Cl. 202-248.000.

Naffa, Faisal A., to AAR Corp. Punch type release lock. 4,372,715, Cl. 410-79.000.

Nagayama, Masayoshi: *See—*
Ichinomiya, Tsutomu; Hosoe, Mamoru; Nagayama, Masayoshi; Chousa, Hirotaka; and Kimura, Rokusaburo, 4,372,319, Cl. 128-421.000.

Nagy, Peter L.: *See—*
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.

Nahum, Sylvain. Articulated bed. 4,371,996, Cl. 5-69.000.

Nakabayashi, Masao: *See—*
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.

Nakagawa, Kazuyuki: *See—*
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,372,953, Cl. 424-248.500.

Nakagomi, Tamihito: *See—*
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.

Nakai, Fumio: *See—*
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,373,063, Cl. 525-64.000.

Nakao, Toshihiro: *See—*
Motoyama, Kazuyasu; and Nakao, Toshihiro, 4,373,172, Cl. 360-105.000.

Nakashima, Norihiko: *See—*
Yagi, Kazuhisa; Suzuki, Sho; and Nakashima, Norihiko, 4,373,043, Cl. 524-130.000.

Nakashima, Yoshifumi: *See—*
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.

Nakazato, Eiji: *See—*
Takizawa, Junichi; Kojima, Seiichiro; Satoh, Nobuo; and Nakazato, Eiji, 4,372,578, Cl. 280-802.000.

Namsick, Raymond J.: *See—*
Knaus, Ernest; Liggett, Paul E.; and Namsick, Raymond J., 4,372,533, Cl. 254-93.0HP.

Narasimhan, Mandayam J., Jr.; and Thirmulachar, Mandayam J., to Source Technology, Inc. Liquid fuel for use in internal combustion engines. 4,372,753, Cl. 44-52.000.

National Can Corporation: *See—*
Cochran, Donald D., 4,372,455, Cl. 215-100.00A.

National Distillers & Chemical Corp.: *See—*
Memering, Leroy J., 4,373,051, Cl. 524-427.000.
Muller, Werner C.; and Miller, Franklyn D., 4,372,822, Cl. 203-19.000.

Naturel, Christian; and Minot, Etienne, to Carbonisation Entreprise et Ceramique (C.E.C.). Spray nozzle. 4,372,494, Cl. 239-553.300.

NCR Corporation: *See—*
Chiao, Samuel Y., 4,372,033, Cl. 29-571.000.

Neale, Adeline I., executrix: *See—*
Ikin, John B.; and Neale, Denis M., deceased, 4,372,678, Cl. 355-37.000.

Neale, Denis M., deceased: *See—*
Ikin, John B.; and Neale, Denis M., deceased, 4,372,678, Cl. 355-37.000.

Neathery, David O.: *See—*
Kincheloe, David W.; and Neathery, David O., 4,372,503, Cl. 242-183.000.

Neder, Gunter: *See—*
Kiener, Heinz; Neder, Gunter; and Schurger, Ranier, 4,372,628, Cl. 308-187.100.

Nees, Stephan. Device for cultivation of matrix-bound biologic cell systems. 4,373,029, Cl. 435-286.000.

Neilson, William J., to Smith International, Inc. Dynamic O-ring seal. 4,372,624, Cl. 384-94.000.

Nejedly, Pavel: *See—*
Landa, Vaclav; Vitek, Jaromir; Nejedly, Pavel; Holpuch, Vladimir; Bubelis, Juozas; and Stepanovicius, Atanas-Nemezyus, 4,372,826, Cl. 204-43.00T.

Nelli, Giuseppe: *See—*
Gratani, Francesco; Nelli, Giuseppe; Di Battista, Piero; and Cicchetti, Osvaldo, 4,373,042, Cl. 524-100.000.

Nelson, Charles W., to Apollo Hair Systems, Inc. Method and apparatus for attachment of hair units. 4,372,330, Cl. 132-53.000.

Nelson, Paul A.; and Horowitz, Jeffrey S., to United States of America, Energy. Heat pump apparatus. 4,372,376, Cl. 165-104.120.

Nenninger, Klaus; and Van Rijckevorsel, Rainer, to Clinicon Mannheim GmbH. Medical test strip holding device. 4,372,682, Cl. 356-244.000.

Nestler, Michael: *See—*
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.

Neti, Radhakrishna M.; and Rocks, Raymond E., to Beckman Instruments, Inc. Fluorescent sulfur dioxide analyzer having an improved sulfur dioxide generator. 4,372,915, Cl. 422-91.000.

Neumann, Peter; Elser, Wolfgang; Bock, Gustav; and Kermer, Wolf-Dieter, to BASF Aktiengesellschaft. Isoindoline dyes, their preparation and use. 4,373,102, Cl. 544-143.000.

Neuzil, Richard W.; and Priegnitz, James W., to UOP Inc. Process for the isomerization of glucose. 4,373,025, Cl. 435-94.000.

Neuzil, Richard W.: *See—*
Kulprathipanja, Santi; and Neuzil, Richard W., 4,372,876, Cl. 252-430.000.

New York University: *See—*
Fish, Irving; Schwartz, Stephen A.; and Samuels, Stanley, 4,372,974, Cl. 424-319.000.

Newkirk, David D.; and Wilhoit, Darrel L., to Crown Zellerbach Corporation. Method for upgrading paper and the product formed thereby. 4,372,815, Cl. 162-158.000.

Newman, Fred C., to Continental Group, Inc., The. Annular seam between two container body halves. 4,372,459, Cl. 220-76.000.

Newton, Charles L.; and Fuini, Dennis L., to Air Products and Chemicals, Inc. Recovery of power from the vaporization of natural gas. 4,372,124, Cl. 60-648.000.

NGK Insulators, Ltd.: *See—*
Kaneno, Masayuki; and Kajihara, Takehiro, 4,373,030, Cl. 501-152.000.

NGK Spark Plug Co., Ltd.: *See—*
Toda, Nobuhiro; and Yamada, Masahiko, 4,372,824, Cl. 204-25.000.

NHK Spring Co., Ltd.: *See—*
Inoue, Kanji, 4,372,576, Cl. 280-689.000.

Nichol, Charles A.: *See—*
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,372,957, Cl. 424-251.000.

Nicholas, James E. Outside combustion air unit for masonry fireplace. 4,372,288, Cl. 126-143.000.

Nicholson, Terence P. Gaskets for cylinder heads. 4,372,564, Cl. 277-235.00B.

Nieh, Edward C. Y., to Texaco Inc. Vanadium-amine corrosion inhibitor system for sour gas conditioning solutions. 4,372,873, Cl. 252-389.00R.

Nielsen, Flemming S. Method for the manufacturing of fuel briquettes. 4,372,749, Cl. 44-1.00D.

Nielsen, Olympia. Insole. 4,372,057, Cl. 36-10.000.

Niigata, Kunihiro: *See—*
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,373,106, Cl. 564-85.000.

Niimura, Koichi: *See—*
Yoshikumi, Chikao; Fujii, Takayoshi; Saito, Kenichi; Fujii, Masahiko; and Niimura, Koichi, 4,372,890, Cl. 260-429.00R.

Nikko Kogyo Kabushiki Kaisha: *See—*
Mizuno, Akira, 4,373,112, Cl. 174-65.00R.

Nilsson, Claes T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,372,908, Cl. 264-292.000.

Nippon Electric Co., Inc.: *See—*
Suzuki, Yoshiharu; and Kai, Tomokazu, 4,373,206, Cl. 455-103.000.

Nippon Electric Co., Ltd.: *See—*
Mizota, Yasuhiro, 4,373,205, Cl. 455-86.000.
Mizukami, Mineo; and Konishi, Tatsuo, 4,373,168, Cl. 358-19.000.

Nippon Oil Company, Limited: *See—*
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,372,919, Cl. 422-137.000.

Nippon Paint Co., Ltd.: *See—*
Furukawa, Junji; Furuno, Nobuo; Matsumura, Akira; and Kuwajima, Teruaki, 4,373,074, Cl. 526-92.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Iwatani, Nobuo, 4,372,223, Cl. 108-143.000.

Nippon Steel Corporation: *See—*
Asai, Yoshihiko; Hori, Masao; and Tokumitsu, Naoki, 4,373,128, Cl. 219-73.110.

Nippon Telegraph & Telephone Public Corporation: *See—*
Asano, Yoshihiro; Morinaka, Akira; and Murase, Kei, 4,373,004, Cl. 428-328.000.
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, 4,372,647, Cl. 350-96.330.

Nis, John R.: *See—*
Coucoulas, Alexander; and Nis, John R., 4,372,771, Cl. 65-75.000.

Nisenson, Jules: *See—*
Waine, Martin; and Nisenson, Jules, 4,372,432, Cl. 192-8.00C.

Nishi, Takao: *See—*
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,372,953, Cl. 424-248.500.

Nishihira, Keigo: *See—*
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, 4,373,107, Cl. 564-473.000.

Nishina, Yasuhide: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,372,986, Cl. 427-40.000.
Nissan Motor Co., Ltd.: *See*—
Kitakami, Toshiyuki; and Akiyama, Yoshinori, 4,372,613, Cl. 297-481.000.
Matsumura, Akira, 4,373,161, Cl. 343-717.000.
Matsuoka, Hideoki, 4,372,579, Cl. 280-802.000.
Mizushima, Yoichi; and Hosonaga, Taketoshi, 4,372,607, Cl. 297-325.000.
Sano, Isao; and Kanamori, Hiroshi, 4,373,153, Cl. 340-87.000.
Shimizu, Michiro; and Tsunoda, Masakaru, 4,373,116, Cl. 179-1.05M.
Takase, Sadao, 4,372,274, Cl. 123-491.000.
Watanabe, Takeshi, 4,372,701, Cl. 403-24.000.
Nolte, Kenneth G.: *See*—
Smith, Michael B.; and Nolte, Kenneth G., 4,372,380, Cl. 166-250.000.
Nomura, Hirokazu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,372,986, Cl. 427-40.000.
Nonaka, Hirohiko: *See*—
Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Tuneyoshi; Takashima, Koichi; and Kato, Yasuhiko, 4,372,846, Cl. 210-86.000.
Noonan, D. Thomas, to Xerox Corporation. CRT Housing support and rocking tilt apparatus. 4,372,515, Cl. 248-178.000.
Nordica S.p.A.: *See*—
Pozzobon, Alessandro, 4,372,061, Cl. 36-117.000.
Nordson Corporation: *See*—
Harjar, Martin J.; and Noss, Jeffrey S., 4,372,721, Cl. 414-5.000.
Noren, Jan O.: *See*—
Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, 4,372,894, Cl. 260-941.000.
Noss, Jeffrey S.: *See*—
Harjar, Martin J.; and Noss, Jeffrey S., 4,372,721, Cl. 414-5.000.
Notarione, Patrick D.; Turk, Ronald K.; and Grafius, Gerald, to Swanson-Erie Corporation. Apparatus and method for feeding thin parts. 4,372,463, Cl. 221-10.000.
Novex Foreign Trade Co. Ltd. for Development and Commercialization of Inventions: *See*—
Szereday, Pal, 4,372,854, Cl. 210-242.300.
Nuzzo, Benjamin: *See*—
Barnett, Lawrence; Cordoba, Julio; and Nuzzo, Benjamin, 4,372,419, Cl. 180-289.000.
Nyquist, Lawrence M. Shelf mounting bracket and assembly. 4,372,516, Cl. 248-235.000.
Oberley, William J., to Koppers Company, Inc. Non-resinous, uncured tire retardant and products produced therewith. 4,373,010, Cl. 428-532.000.
Oberstrass, Detlev, to Barmag Barmer Maschinenfabrik AG. Drive system for yarn false twisting apparatus. 4,372,106, Cl. 57-334.000.
Occidental Engineering Corporation: *See*—
Chapman, Wilson M.; and Jensen, Norman L., Jr., 4,372,751, Cl. 44-2.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,372,615, Cl. 299-2.000.
Occidental Research Corporation: *See*—
Parziale, Victor E.; Dines, Martin B.; and DiGiacomo, Peter M., 4,373,079, Cl. 528-9.000.
Ochsenfarth, Hans-Christian: *See*—
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, to Magnaflux Corporation. Pipeline inspection apparatus. 4,372,658, Cl. 354-63.000.
Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, to Asahi Glass Company Ltd. Producing sulfur tetrafluoride using amine/hydrogen fluoride complex. 4,372,938, Cl. 423-469.000.
Odermann, Charles R.; and Wurst, John W., to Singer Company, The. Buttonhole paddle switch position sensing arrangement in a sewing machine. 4,372,231, Cl. 112-158.00B.
Odermann, Charles R., to Singer Company, The. Safety general purpose presser foot for straight and zig zag stitching. 4,372,233, Cl. 112-235.000.
Oerlikon-Buhrle U.S.A. Inc.: *See*—
Sarcia, Domenico S., 4,372,128, Cl. 62-6.000.
Ogawa, Hitashi: *See*—
Motonami, Masanao; Ogawa, Hisashi; and Imai, Yoshikazu, 4,372,580, Cl. 280-802.000.
Ogawa, Tadahiro. Apparatus for taking a continuous photograph of the exterior of an article. 4,372,659, Cl. 354-80.000.
Ohhara, Minoru: *See*—
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.
Ohloff, Gunther; and Giersch, Wolfgang K., to Firmenich SA. Unsaturated alicyclic compounds, their use as perfuming and flavoring ingredients. 4,372,881, Cl. 252-522.00R.
Ohmura, Hidemasa: *See*—
Sato, Toshio; Suzuki, Sho; and Ohmura, Hidemasa, 4,373,053, Cl. 524-457.000.
Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, 4,372,948, Cl. 424-180.000.
Ohshima, Ken: *See*—
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Ohtsu Tire and Rubber Co. Ltd.: *See*—
Osada, Isao; and Sano, Shoichi, 4,372,365, Cl. 152-158.000.
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Ishiki, Minoru; and Kawasaki, Kunio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Continuous process for producing reinforced resin laminates. 4,372,800, Cl. 156-307.300.
Okamoto, Katsunari; Edahiro, Takao; Kawana, Akio; and Miya, Tetsuo, to Nippon Telegraph & Telephone Public Corporation. Single mode optical fibers. 4,372,647, Cl. 350-96.330.
Okamoto, Kenji: *See*—
Hiyama, Yasuhiro; Oshizawa, Hidekazu; Okamoto, Kenji; and Kobayashi, Masayoshi, 4,372,266, Cl. 123-357.000.
Okaniwa, Kenichiro: *See*—
Masukawa, Toyoaki; Ishikawa, Wataru; Okaniwa, Kenichiro; and Yamashita, Kiyoshi, 4,373,017, Cl. 430-270.000.
Okazaki, Takahisa: *See*—
Takemura, Yasuhiko; Okazaki, Takahisa; and Imai, Akira, 4,372,323, Cl. 128-660.000.
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, to Sanraku-Ocean Co., Ltd. Anthracycline derivatives. 4,373,094, Cl. 536-6.400.
Oku, Junzo: *See*—
Yamamoto, Ryozo; Yanase, Keiichi; and Oku, Junzo, 4,372,532, Cl. 251-175.000.
Okumura, Tamotsu; and Kadono, Tetsuro, to Shionogi & Co., Ltd. Reverse-phase thin layer chromatographic plate. 4,372,850, Cl. 210-198.300.
Olah, George A. Bifunctional acid-base catalyzed conversion of heterosubstituted methanes into olefins. 4,373,109, Cl. 585-640.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Production of high viscosity index lubricating oil stock. 4,372,839, Cl. 208-59.000.
Olin Corporation: *See*—
Coppola, Pasquale J.; and Dever, Gerald V., Jr., 4,372,352, Cl. 141-1.000.
Olsen, Everett O.: *See*—
Brown, Christopher R.; and Olsen, Everett O., 4,372,164, Cl. 73-704.000.
Olson, Alan J.; and Vielhaber, Robert G., to B. F. Goodrich Company, The. Recovery of chlorinated poly(vinyl chloride). 4,373,093, Cl. 528-491.000.
Olson, Larry D., to UOP Inc. Hybrid woven glass cloths. 4,372,347, Cl. 139-420.00C.
Olympus Optical Co., Ltd.: *See*—
Motoyama, Kazuyasu; and Nakao, Toshihiro, 4,373,172, Cl. 360-105.000.
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Ono, Chikai: *See*—
Toyoda, Kazuhiro; Ono, Chikai; and Hayashi, Toshio, 4,373,195, Cl. 365-154.000.
Onoda, Mamoru: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.
Orangeburg Technologies, Inc.: *See*—
Burnham, Francis L., 4,372,114, Cl. 60-325.000.
Orbisphere Corporation Wilmington: *See*—
Hale, John M.; and Weber, Eugen, 4,372,021, Cl. 29-235.000.
Orcon Corporation: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,372,801, Cl. 156-434.000.
Orenstein, Henry. Electronic question and answer game. 4,372,554, Cl. 273-1.00E.
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Hiyama, Yasuhiro; Oshizawa, Hidekazu; Okamoto, Kenji; and Kobayashi, Masayoshi, 4,372,266, Cl. 123-357.000.
Ostgaard, John T., to Pipe Technology Systems, Inc. Pile installation and removal mechanisms in off-shore rigs and method of using same. 4,372,707, Cl. 405-224.000.
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Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, 4,372,938, Cl. 423-469.000.
Otsuka Pharmaceutical Company, Limited: *See*—
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, 4,372,953, Cl. 424-248.500.
Ott, Hans, to Sandoz Ltd. 5, 10-Dihydroimidazo[2,1-b]quinazolines and pharmaceutical compositions containing them. 4,372,956, Cl. 424-251.000.
Otten, David M., to PepsiCo Inc. Vending machine control circuit. 4,372,464, Cl. 221-14.000.
Otterson, Robert C. Single wheel trailer support. 4,372,569, Cl. 280-78.000.
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McColl, Bruce J., 4,372,407, Cl. 180-6.200.
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Van Zantwyk, Conrad G., 4,372,760, Cl. 55-227.000.
Oyama, Kaoru: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.
Ozen Corporation: *See*—
Watanabe, Katsumi, 4,373,199, Cl. 369-31.000.
Paccar Inc.: *See*—
Parks, Richard W., 4,372,279, Cl. 123-557.000.
Packaging Corporation of America: *See*—
Champlin, Charles L.; Misura, John T.; and Reiser, Carl J., 4,372,763, Cl. 55-501.000.
Pagel, Gary A. Storm window unit having expandable frame. 4,372,082, Cl. 49-62.000.
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Bonazoli, Robert P.; and Paget, Fredrick W., 4,373,146, Cl. 315-209.00R.
Pailler, Jean-Yves, to Etablissements EVIRA. Mould for producing profiled elements of plastics material. 4,372,524, Cl. 249-79.000.
Pako Corporation: *See*—
Kaufmann, Kenneth M., 4,372,665, Cl. 354-298.000.
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PanCanadian Petroleum Limited: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Panclor S.A.: *See*—
Spaziante, Placido M.; and Sioli, Giancarlo, 4,372,827, Cl. 204-95.000.
Panelgraphic Corporation: *See*—
Russell, Raymond J., 4,373,007, Cl. 428-412.000.
Panzhauser, Erich: *See*—
Haugeneder, Hans; and Panzhauser, Erich, 4,372,373, Cl. 165-54.000.
Papanu, Steven C.; and Curtis, Ralston, to Zoecon Corporation. Novel pesticidal formulation. 4,372,943, Cl. 424-78.000.
Papp, Maria H.: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Parel, Claude: *See*—
Uebelhart, Walter; Gilomen, Beat; and Parel, Claude, 4,372,108, Cl. 57-358.000.
Parker, Alan: *See*—
Farnhill, William M.; and Parker, Alan, 4,372,109, Cl. 57-401.000.
Parker, Bernard, to Baker Instruments Corp. Automatic pipettor employing an adjustable volume delivery pump. 4,372,175, Cl. 73-864.170.
Parks, Richard W., to Paccar Inc. Heated fuel line. 4,372,279, Cl. 123-557.000.
Parlman, Robert M.: *See*—
Bresson, Clarence R.; and Parlman, Robert M., 4,372,844, Cl. 209-166.000.
Paros, Jerome M.: *See*—
EerNisse, Errol P.; and Paros, Jerome M., 4,372,173, Cl. 73-862.590.
Parziale, Victor E.; Dines, Martin B.; and DiGiacomo, Peter M., to Occidental Research Corporation. Layered or amorphous cyclic organometallic inorganic polymers. 4,373,079, Cl. 528-9.000.
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Preziosi, Anthony F.; Patel, Gordhanbhai N.; Denkewalter, Robert G.; and Baughman, Ray H., 4,373,032, Cl. 521-38.000.
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Garcia, Francisco E., 4,372,137, Cl. 70-41.000.
Patrick, Billy J. Bidet alternative apparatus. 4,371,993, Cl. 4-448.000.
Patzschke, Hans-Peter; and Gobel, Armin, to Herberts Gesellschaft mit Beschrankter Haftung. Pre-condensed, thermosetting aqueous varnish coating agent and its utilization for cathodic deposition upon electrically conducting surfaces. 4,373,059, Cl. 524-761.000.
Patzschke, Hans-Peter; and Gobel, Armin, to Herberts Gesellschaft mit beschrankter Haftung. Self-cross-linking, thermosetting, aqueous lacquer coating material, and its utilization for the cathodic deposition upon electrically conducting surfaces. 4,373,072, Cl. 525-438.000.
Paul, Hans-Gunther: *See*—
Moraw, Klaus; and Paul, Hans-Gunther, 4,373,038, Cl. 523-156.000.
Paul, Herman L., Jr., to Continental Disc Corporation. Overpressure relief control system. 4,372,334, Cl. 137-12.000.
Paul, James M.; and Espenscheid, Wilton F., to Mobil Oil Corporation. Method for restoring formation previously leached with an ammonium leach solution. 4,372,616, Cl. 299-5.000.
Paul Troester Maschinenfabrik: *See*—
Menges, George; Kircher, Klaus; and Franzkoch, Bernd, 4,372,898, Cl. 264-22.000.
Pearey, John T., to Union Special G.m.b.H. Self-advancing mineral mining installation including tilting machine support. 4,372,618, Cl. 299-31.000.
Pebco, Inc.: *See*—
Ladt, Carroll H., 4,372,730, Cl. 414-786.000.
Pedain, Josef: *See*—
Nachtkamp, Klaus; Bock, Manfred; Mennicken, Gerhard; and Pedain, Josef, 4,373,081, Cl. 528-45.000.
Pelley, Ronald L. Escape chute. 4,372,423, Cl. 182-42.000.
Pemco-Kalamazoo, Inc.: *See*—
Black, John W.; and Slager, Ralph E., 4,372,738, Cl. 425-451.900.
PepsiCo Inc.: *See*—
Otten, David M., 4,372,464, Cl. 221-14.000.
Perkey, Conrad G.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,372,112, Cl. 60-323.000.
Perkin-Elmer Corporation, The: *See*—
Loveland, Robert S., 4,372,166, Cl. 73-861.280.
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Perlin, Alfred R., to Kendall Company, The. Compression device. 4,372,297, Cl. 128-64.000.
Pestellini, Vittorio; Ghelardoni, Mario; Giannotti, Danilo; Meli, Alberto; and Maggi, Carlo A., to A. Menarini S.A.S. Compound having antitussive activity. 4,372,958, Cl. 424-253.000.
Peter, Karl: *See*—
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.
Peters, Kenneth; and Culpin, Barry, to Chloride Group Limited. Electric storage batteries. 4,373,015, Cl. 429-57.000.
Petersen, Hans C.; Kyster, Erik; Thomsen, Svend E.; and Flagstad, Carl O., to Danfoss A/S. Hydrostatic steering device. 4,372,413, Cl. 180-152.000.
Petersen-Hoj, Peter, to Tetra Pak Developpement SA. Laminated material. 4,373,002, Cl. 428-213.000.
Petersen, Marvin J.: *See*—
Fisher, Wayland I.; and Petersen, Marvin J., 4,372,184, Cl. 83-98.000.
Peterson, David, to U.S. Peroxygen Company. Di(acylperoxy)-1,4-cyclohexane dimethanol-bis-carbonates. 4,372,877, Cl. 260-453.0RZ.
Peterson, Ralph W., to Control Data Corporation. Low frequency electronically steerable cylindrical slot array radar antenna. 4,373,162, Cl. 343-771.000.
Petro-Canada Exploration Inc.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
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Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,372,775, Cl. 71-67.000.
Watson, Frederick D.; Mayse, Weldon D.; and Franse, Albert D., 4,372,837, Cl. 204-186.000.
Petros, Andrew J., to Mesta Machine Company. Method and apparatus for checking mill roll bearing assembly. 4,372,625, Cl. 384-129.000.
Petros, Andrew J., to Mesta Machine Company. Taper journal bearing for rolls for use in rolling mills. 4,372,626, Cl. 384-129.000.
Pfannkuch, Robert B.; and Grab, Fred W., to Bell & Howell Company. Apparatus and method for producing rapid, high resolution hard color copies from computer-based graphics and digital image processing systems. 4,373,156, Cl. 340-703.000.
Pflaum, August, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Apparatus for bending a pressure roll of a rotary printing press. 4,372,205, Cl. 101-153.000.
Phillips, Alan G.: *See*—
Church, Peter K.; and Phillips, Alan G., 4,372,823, Cl. 204-2.100.
Phillips Petroleum Company: *See*—
Bresson, Clarence R.; and Parlman, Robert M., 4,372,844, Cl. 209-166.000.
Edmonds, James T., Jr., 4,373,090, Cl. 528-387.000.
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Gardner, Lloyd E., 4,372,842, Cl. 208-254.00H.
Hunt, Harold R., 4,373,024, Cl. 435-41.000.
Hutson, Thomas, Jr., 4,373,110, Cl. 585-719.000.
Johnson, Paul H., 4,372,937, Cl. 423-454.000.
Wood, Jerold D.; and Stacy, Carl J., 4,373,041, Cl. 524-77.000.
Phillips, Richard B.; Kempf, Arthur W.; and Eckert, Robert C., to International Paper Company. Chlorine free process for bleaching lignocelluloic pulp. 4,372,812, Cl. 162-40.000.
Pierce, O. Leon, to Universal Data Systems, Inc. DC to DC converter for line powered modem. 4,373,117, Cl. 179-2.0DP.
Pierre Fabre SA: *See*—
Mouzin, Gilbert; Cousse, Henri; Stenger, Antoine; and Casadio, Sylvano, 4,372,975, Cl. 424-324.000.

Pila, Karl. Meat cutting band blade machine. 4,372,185, Cl. 83-101.000.
Pilat, Eugene R.; Franks, George J., Jr.; and Dyben, Jerry F. Electronic security device and method. 4,372,590, Cl. 292-33.000.
Pilkington Brothers Limited: *See—*
Cross, Raymond P.; and Simpkin, Gordon T., 4,372,774, Cl. 65-114.000.
Pillsbury Company, The: *See—*
Haasl, Michael J.; Snider, Kenneth D.; and Murphy, William L., 4,372,982, Cl. 426-549.000.
Pindell, Robert G.: *See—*
Rooney, John F.; and Pindell, Robert G., 4,372,382, Cl. 166-264.000.
Pinson, George T.; and Hunter, Alex B., to Boeing Company, The. Dispensing system for use on a carrier missile for rearward ejection of submissiles. 4,372,216, Cl. 102-489.000.
Pioneer Electronic Corporation: *See—*
Sunaga, Yoshimitsu; and Honda, Satoru, 4,373,170, Cl. 360-71.000.
Piotti, Joseph J., Jr. Weight attachment for baseball glove. 4,371,983, Cl. 2-19.000.
Pipe Technology Systems, Inc.: *See—*
Ostgaard, John T., 4,372,707, Cl. 405-224.000.
Pitney Bowes Inc.: *See—*
Calabrese, Richard A., 4,372,247, Cl. 118-116.000.
Pitt, Gillies D.; and Williamson, Roger J., to ITT Industries, Inc. Apparatus for measuring fluid flow. 4,372,165, Cl. 73-861.220.
Plate, Arthur: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,372,201, Cl. 100-7.000.
PLM Aktiebolag: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,372,908, Cl. 264-292.000.
Plum, Helmut: *See—*
Ritz, Jurgen; Fischer, Hannes; and Plum, Helmut, 4,373,078, Cl. 526-317.000.
Plumet, Lucien: *See—*
Clerbois, Lucien; and Plumet, Lucien, 4,372,813, Cl. 162-48.000.
Plunkett, Galen P., Jr, Galen P.: *See—*
Means, Rodney J.; Plunkett, Galen P., Jr, Galen P.; Dennis, Charles A.; and Moon, John L., 4,373,183, Cl. 364-200.000.
Pohl, Siegfried: *See—*
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.
Pohlmann, Erich; and Doetsch, Hans-Peter, to Schneider, Christian. Apparatus for heat transformation. 4,372,127, Cl. 62-6.000.
Pokhis, Naum. Conical bladder. 4,371,985, Cl. 2-22.000.
Polsky, Bernice. Seamless crotch. 4,371,989, Cl. 2-227.000.
Pomerantz, Daniel I.; and Baxter, Richard V., Jr., to Emhart Industries, Inc. Method and means for programming the operation of an apparatus. 4,372,054, Cl. 34-44.000.
Pomp, Jurgen: *See—*
Wiener, Dieter; Sulzer, Gerd; Skyba, Rudolf, deceased; and Pomp, Jurgen, 4,372,085, Cl. 51-216.0ND.
Pontefract, Robert A., to White Consolidated Industries, Inc. Laminated gage glass assembly. 4,372,652, Cl. 350-319.000.
Poole, Bordie D., Jr.: *See—*
Adams, Richard R.; MacConochie, Ian O.; and Poole, Bordie D., Jr., 4,372,680, Cl. 356-51.000.
Pope, Daniel L.: *See—*
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., 4,372,535, Cl. 254-319.000.
Porter, David L., to Dow Chemical Company, The. Purification of alkali metal hydroxides. 4,372,924, Cl. 423-179.000.
Potts, James E., to Union Carbide Corporation. Disposable articles coated with degradable water insoluble polymers. 4,372,311, Cl. 128-287.000.
Pou, Frederick M., to Monarch Marking Systems, Inc. High quality printer. 4,372,696, Cl. 400-124.000.
Powell, Andrian J. C.: *See—*
Powell, John E.; and Powell, Andrian J. C., 4,372,712, Cl. 406-153.000.
Powell, John E.; and Powell, Andrian J. C., to Beloit Corporation. Continuous transfer of particles from a gaseous conveying medium to a liquid conveying medium. 4,372,712, Cl. 406-153.000.
Powers, Jerrold V., Jr., to BDM Corporation, The. Shut-in device for stopping the flow of high pressure fluids. 4,372,378, Cl. 166-57.000.
Pozzobon, Alessandro, to Nordica S.p.A. Device for adjusting the flexibility of a ski boot or the like article. 4,372,061, Cl. 36-117.000.
PPG Industries, Inc.: *See—*
Krumwiede, John F.; and Amrhein, Alan G., 4,372,770, Cl. 65-27.000.
Schwartz, Richard A., 4,373,075, Cl. 526-230.500.
Seiner, Jerome A.; and Schimmel, Karl F., 4,373,083, Cl. 528-67.000.
Prescott, John F.: *See—*
Hoelzen, Warren R.; Prescott, John F.; and Tyler, Michael N., 4,372,212, Cl. 102-264.000.
Prest, William M., Jr., to Xerox Corporation. Optically isotropic devices. 4,373,065, Cl. 525-132.000.
Preziosi, Anthony F.; Patel, Gordhanbhai N.; Denkewalter, Robert G.; and Baughman, Ray H., to Allied Corporation. Metal salts of polyacetylenic compounds and uses thereof as ion exchange and thermochromic polymers. 4,373,032, Cl. 521-38.000.
Priegnitz, James W.: *See—*
Neuzil, Richard W.; and Priegnitz, James W., 4,373,025, Cl. 435-94.000.
Pries, Robert W., to International Business Machines Corporation. Self-triggering quality control sensor. 4,372,672, Cl. 355-14.00R.
Primm, Alice E.: *See—*
Leavitt, Alvan W.; and Primm, Alice E., 4,373,159, Cl. 343-6.50R.
Principe, Viktor, to Arthur Schmid AG. Thread monitoring device. 4,372,235, Cl. 112-273.000.
Pritchitt, Frederick J., to Marpac Industries, Inc. Dispensing valve to be used with bottles of fluent imaging material for the development of electrostatic images. 4,372,467, Cl. 222-501.000.
Process Control Corporation: *See—*
Kean, James P., Jr., 4,372,713, Cl. 406-172.000.
Procter & Gamble Company, The: *See—*
Koster, Robertus J. C.; Six, Volker; and Hale, Peter, 4,372,882, Cl. 252-529.000.
Progressive Machine Products, Inc.: *See—*
Betush, Frank A., 4,372,307, Cl. 128-224.000.
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., to Stow/Davis Furniture Company. Combination wire enclosure and wire. 4,372,629, Cl. 312-223.000.
Provincial Holdings Ltd.: *See—*
Salter, Robert S.; Boorman, Roy S.; and Gilders, Ross D., 4,372,782, Cl. 75-118.00R.
Puckett, Hubert L., to Ceco Corporation, The. Machine for progressively closing flanges of cap strips on standing rib roofs. 4,372,022, Cl. 29-243.580.
Pullman Incorporated: *See—*
Raksanyi, William; and Marsh, Ronald W., 4,372,604, Cl. 297-162.000.
Pullmax Aktiebolag: *See—*
Lehtinen, Esko, 4,372,183, Cl. 83-71.000.
Purrmann, Robert: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Habuer, Heinz-Joachim, 4,372,836, Cl. 204-159.230.
Puskas, Marian E.: *See—*
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Quaker Oats Company, The: *See—*
Ciganko, David J., 4,372,238, Cl. 112-439.000.
Quang, Pham K.: *See—*
Kings, Donald H. M.; Marckmann, Jean-Claude; and Quang, Pham K., 4,373,016, Cl. 430-126.000.
Quartex, Inc.: *See—*
EerNisse, Errol P.; and Paros, Jerome M., 4,372,173, Cl. 73-862.590.
Quartrol Corporation: *See—*
Livorsi, Carl F., 4,372,530, Cl. 251-173.000.
Quelch, Albert G. B. Contour bottle carrier. 4,372,598, Cl. 294-87.200.
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr. Apparatus for oxygen sprinkle smelting of sulfide concentrates. 4,372,540, Cl. 266-171.000.
Quick, William H.: *See—*
Strahan, Virgil H.; James, Kenneth A.; and Quick, William H., 4,372,646, Cl. 350-96.310.
Quinlan, Patrick M., to Petrolite Corporation. Inhibition of microbiological growth with thiazine quaternary ammonium salts of polyepihalohydrin. 4,372,775, Cl. 71-67.000.
Quinn, Paul A., Jr., to International Business Machines Corporation. Sheet feeder for typewriters. 4,372,699, Cl. 400-625.000.
R. W. Hartnett Company: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,372,437, Cl. 198-380.000.
Racal Communications Equipment Limited: *See—*
Rhodes, Stephen L., 4,373,203, Cl. 375-10.000.
Racal Recorders Ltd.: *See—*
Balme, Michael J.; and Edwards, David T., 4,373,154, Cl. 340-347.0DD.
Raftis, Spiros G., to Red Valve Co., Inc. Pinch valve sleeve. 4,372,528, Cl. 251-4.000.
Raible, Donald A., to Bentley Laboratories, Inc. Blood oxygenator. 4,372,914, Cl. 422-46.000.
Raitto, Russell G., to Concord Laboratories, Inc. Method for taking a blood sample. 4,372,325, Cl. 128-763.000.
Raksanyi, William; and Marsh, Ronald W., to Pullman Incorporated. Stowable armrest table assembly. 4,372,604, Cl. 297-162.000.
Ramer, James L. Pipeline energy recapture device. 4,372,113, Cl. 60-325.000.
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, to Metallwerk Max Brose GmbH & Co. Adjusting mechanism for the seat of an automobile. 4,372,521, Cl. 248-430.000.
Ramsey, Henry R., to Webster Spring Co. Inc. Spring assembly. 4,372,546, Cl. 267-100.000.
Randleman, Marvin T.: *See—*
Kimball, Michael E.; and Randleman, Marvin T., 4,373,082, Cl. 528-60.000.
Ranford, Alan B.: *See—*
Cornell, William D.; Crouther, Ronald; Dyer, Howard P.; and Ranford, Alan B., 4,372,336, Cl. 137-205.000.
Rasmussen, George E.; and Donkle, Lucius B., Jr., to Interlake, Inc. Gravity-feed storage and delivery system. 4,372,451, Cl. 211-187.000.
Rasmussen, Lauritz B. L., to Superfos Glasuld A/S (Superfos A/S). Method for use in the manufacture of a building element. 4,372,799, Cl. 156-285.000.
Rauch, Jeffrey S., to Mechanical Technology Incorporated. Oil backed Stirling engine displacer diaphragm. 4,372,115, Cl. 60-520.000.

Rausch, John J.; and Van Thyne, Ray J., to Rausch, John J.; Van Thyne, Ray J.; and Material Sciences Corporation. Process of making surface alloyed parts. 4,372,995, Cl. 427-300.000.
Raychem Corporation: *See—*
Greuel, Walter J., Jr., 4,372,796, Cl. 156-187.000.
Lutz, Michael A., 4,372,693, Cl. 374-111.000.
RCA Corporation: *See—*
Vossen, John L., Jr., 4,372,806, Cl. 156-643.000.
Vossen, John L., Jr.; and Halon, Bernard, 4,372,807, Cl. 156-643.000.
Rea, James H.: *See—*
Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., 4,373,066, Cl. 525-133.000.
Rebel, Herbert, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Varnishing units on printing presses. 4,372,244, Cl. 118-46.000.
Red Valve Co., Inc.: *See—*
Raftis, Spiros G., 4,372,528, Cl. 251-4.000.
Reddy, Malireddy S.: *See—*
Reinbold, George W.; and Reddy, Malireddy S., 4,372,979, Cl. 426-36.000.
Reed, Marion G.; Loken, Tor; and Bryhn, Odd R., to Chevron Research Company. Stabilizing clay soil with chemical solutions. 4,372,786, Cl. 106-900.000.
Reed Rock Bit Company: *See—*
Drake, Eric F., 4,372,404, Cl. 175-374.000.
Trevino, Joe, Jr., 4,372,402, Cl. 175-318.000.
Refined Industry Company Limited, The: *See—*
Lee, Cheuk-Ming, 4,372,489, Cl. 238-10.00F.
Reflux Limited: *See—*
Ames, Robert K., 4,372,383, Cl. 166-266.000.
Regie National des Usines Renault: *See—*
Coste, Jean-Claude, 4,373,149, Cl. 318-281.000.
Reichert, David A.: *See—*
Del Principe, Robert M.; and Reichert, David A., 4,372,557, Cl. 273-88.000.
Reichmanis, Elsa; Roman, Bernard J.; Tai, King L.; and Wilkins, Cletus W., Jr., to Bell Telephone Laboratories, Incorporated. Multiple exposure microlithography patterning method. 4,373,018, Cl. 430-312.000.
Reichmann, Wolfgang; Konig, Klaus; and Schonfelder, Manfred, to Bayer Aktiengesellschaft. Polyisocyanates, preparation and use thereof. 4,373,080, Cl. 528-45.000.
Reid, Keith. Air mattresses. 4,371,999, Cl. 5-457.000.
Reilly, William W.: *See—*
Mueller, William A.; Ingham, John D.; and Reilly, William W., 4,373,039, Cl. 523-205.000.
Reimbert, Andre. Vessel for storing particulate materials and method of emptying. 4,372,466, Cl. 222-482.000.
Reinauer, Thomas V., to United States Filter Corporation. Emission control apparatus. 4,372,821, Cl. 202-263.000.
Reinbold, George W.; and Reddy, Malireddy S., to Leprino Foods Company. Reduction of curd fines in cheese manufacture. 4,372,979, Cl. 426-36.000.
Reindl, Werner: *See—*
Grewal, Virinder; and Reindl, Werner, 4,372,809, Cl. 156-656.000.
Reinhard Mohn G.m.b.H.: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,372,201, Cl. 100-7.000.
Reiser, Carl J.: *See—*
Champlin, Charles L.; Misura, John T.; and Reiser, Carl J., 4,372,763, Cl. 55-501.000.
Remy, Grandjean, to Ebauches, S.A. Electronic watch movement. 4,372,689, Cl. 368-155.000.
REPA Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,372,012, Cl. 24-68.00R.
Research-Cottrell, Incorporated: *See—*
Bush, John R., 4,372,832, Cl. 204-157.10R.
Rexnord Inc.: *See—*
Bradbury, Bernard G., 4,372,435, Cl. 198-356.000.
Krammer, Robert, deceased, 4,372,441, Cl. 198-781.000.
Rheem Manufacturing Company: *See—*
Clark, Keith R.; and Focia, Michael, Jr., 4,372,028, Cl. 29-460.000.
Rhoades, Craig A.; and Meeks, Thomas. Steam injection method and apparatus for recovery of oil. 4,372,386, Cl. 166-300.000.
Rhoades, James J., to Tapco Products Company, Inc. Sheet bending brake. 4,372,142, Cl. 72-319.000.
Rhodes, Stephen L., to Racal Communications Equipment Limited. Circuit arrangement and method for assessing communication activity on a particular radio communication channel. 4,373,203, Cl. 375-10.000.
Rhodes, William E., III: *See—*
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,372,977, Cl. 424-342.000.
Rhone-Poulenc Industries: *See—*
Botton, Roger; and Cosserat, Dominique, 4,372,935, Cl. 423-393.000.
Helgorsky, Jacques; and Leveque, Alain, 4,372,923, Cl. 423-112.000.
Soula, Gerard, 4,373,070, Cl. 525-332.200.
Rhone-Poulenc Systemes: *See—*
Kings, Donald H. M.; Marckmann, Jean-Claude; and Quang, Pham K., 4,373,016, Cl. 430-126.000.
Rhoton, William A., to Boeing Company, The. Blind hole clamping tool. 4,372,015, Cl. 24-221.00R.
Riba nee Hildebrand, Jutta. Blower for a pressing table. 4,372,065, Cl. 38-15.000.
Richard Wolf GmbH: *See—*
Heckele, Helmut, 4,372,295, Cl. 128-4.000.
Richardson, Donald A.: *See—*
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., 4,372,629, Cl. 312-223.000.
Richardson, Edwin A.: *See—*
Davies, David R.; Richardson, Edwin A.; and Van Zanten, Marinus, 4,372,385, Cl. 166-281.000.
Richardson, Paul N., to Du Pont de Nemours, E. I., and Company. Flame-retardant polyamide compositions. 4,373,049, Cl. 524-375.000.
Richter, Johan C. F. C.; and Sherman, Michael I., to Kamyr, Inc. High pressure feeding. 4,372,711, Cl. 406-63.000.
Ricketts, Rodney H.: *See—*
Doggett, Robert V., Jr.; and Ricketts, Rodney H., 4,372,158, Cl. 73-147.000.
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Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method of rubbling oil shale. 4,372,615, Cl. 299-2.000.
Ricoh Company, Ltd.: *See—*
Fujioka, Yoshisato; and Kawamura, Atsushi, 4,372,654, Cl. 350-427.000.
Yanagawa, Nobuyuki; and Mizuma, Kenichi, 4,372,547, Cl. 271-10.000.
Ridder, Detlef: *See—*
Schumacher, Hermann; Molineus, Tilman; and Ridder, Detlef, 4,372,581, Cl. 282-27.500.
Riffel, Ronald E.: *See—*
Caruthers, John E.; Jay, Robert L.; Riffel, Ronald E.; and Rothrock, Mark D., 4,372,157, Cl. 73-147.000.
Rigny, Paul: *See—*
Chatelet, Jean; Clerc, Michel; Coste, Andre; and Rigny, Paul, 4,372,928, Cl. 423-249.000.
Rilett Energitjanst AB: *See—*
Lindroos, Ingvald R., 4,372,761, Cl. 55-260.000.
Ringe, Stephen J.: *See—*
Stanczak, Edmund A.; and Ringe, Stephen J., 4,372,603, Cl. 296-146.000.
Ringis, Gerald A., to Boeing Company, The. End shaft mount for conveyor. 4,372,440, Cl. 198-728.000.
Risbud, Subhash H.: *See—*
Mahoney, Dennis F.; Kober, Alfred E.; and Risbud, Subhash H., 4,372,227, Cl. 110-342.000.
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., to AMP Incorporated. Tilt latch zero insertion force connector assembly. 4,372,634, Cl. 339-17.00C.
Ritter, Allen M., to General Electric Company. Motor control system. 4,373,150, Cl. 318-336.000.
Ritter, Gerhard: *See—*
Schmidt, Gerhard; Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, 4,372,350, Cl. 140-112.000.
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Ritter, Josef: *See—*
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Ritter, Klaus: *See—*
Schmidt, Gerhard; Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, 4,372,350, Cl. 140-112.000.
Rittmann, Dieter: *See—*
Starp, Franz; and Rittmann, Dieter, 4,372,662, Cl. 354-273.000.
Ritz, Jurgen; Fischer, Hannes; and Plum, Helmut, to Hoechst Aktiengesellschaft. Process for the manufacture of hardenable copolymers and the use thereof. 4,373,078, Cl. 526-317.000.
Rivera, Alfredo. Water feeder conservation tank. 4,371,992, Cl. 4-353.000.
Rivier, Jean E. F.: *See—*
Brown, Marvin R.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,372,884, Cl. 260-112.50S.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acids. 4,372,889, Cl. 260-413.000.
Roach, Malcolm B.: *See—*
Baugh, John L.; Montgomery, James W.; and Roach, Malcolm B., 4,372,390, Cl. 166-373.000.
Robert Bosch GmbH: *See—*
Latsch, Reinhard; and Bianchi, Valerio, 4,372,270, Cl. 123-440.000.
Roberts, Gary P. Automobile bumper. 4,372,595, Cl. 293-131.000.
Robins, Harold J.: *See—*
Stroup, John F.; Robins, Harold J.; and Teeple, Michael, 4,372,910, Cl. 264-532.000.
Robinson, Earl, to Lovable Company, The. Molded reinforced breast cup and method for making same. 4,372,321, Cl. 128-463.000.
Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Sulfur-modified polypropylene ether glycols, a method for preparing them, and polyurethanes prepared therefrom. 4,373,084, Cl. 528-79.000.
Robinson, Joseph G.; and Barnes, David L., to Coal Industry (Patents) Limited. Phenanthrene based polyimide resin. 4,373,089, Cl. 528-353.000.
Robinson, Neil L.; and Silkensen, Ralph D., to International Business Machines Corporation. Multi-element head assembly. 4,373,173, Cl. 360-121.000.
Roche, Charles W., to Uni-Flange Corporation. Adapter flange. 4,372,587, Cl. 285-238.000.

Rocks, Raymond E.: *See—*
Neti, Radhakrishna M.; and Rocks, Raymond E., 4,372,915, Cl. 422-91.000.
Rockwell International Corporation: *See—*
Bailey, Robert F., 4,372,985, Cl. 427-38.000.
Denniston, James L., 4,372,507, Cl. 244-113.000.
Iannucci, Vincent A.; and Haehnel, Rudolf H., 4,372,191, Cl. 87-48.000.
Shutt, Sidney G., 4,372,162, Cl. 73-517.00B.
Shutt, Sidney G., 4,372,520, Cl. 248-604.000.
Strahan, Virgil H.; James, Kenneth A.; and Quick, William H., 4,372,646, Cl. 350-96.310.
Tittmann, Bernhard R.; Ahlberg, Lloyd A.; and Elsley, Richard K., 4,372,163, Cl. 73-602.000.
Wiers, John W.; Roper, Daniel W.; and Johnson, Richard F., 4,372,612, Cl. 297-374.000.
Rockwell, Martin G., to Hewlett-Packard Company. Analog peak voltage detector in a defibrillator. 4,372,324, Cl. 128-695.000.
Roentgen, Paul: *See—*
Krasborn, Gottfried; Roentgen, Paul; Meier, Wilhelm; and Erdweg, Josef, 4,373,130, Cl. 219-203.000.
Rogier, Leonce, to VALEO. Industrial emergency brake. 4,372,427, Cl. 188-72.100.
Rogov, Alexandr R.: *See—*
Surovikin, Vitaly F.; Rogov, Alexandr R.; Sazhin, Gennady V.; and Gorjunov, Georgy L., 4,372,936, Cl. 423-450.000.
Rohm GmbH Chemische Fabrik: *See—*
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.
Rohm and Haas Company: *See—*
Chan, Hak-Foon, 4,372,972, Cl. 424-304.000.
Emmons, William D.; and Feely, Wayne E., 4,373,008, Cl. 428-413.000.
Rohr, Wolfgang; Schirmer, Ulrich; and Wuerzer, Bruno, to BASF Aktiengesellschaft. M-Anilide-urethanes. 4,373,105, Cl. 560-27.000.
Rollins, M. Jack; and Coppin, William P., to Maxon Corporation. Ceramic gate valve and components therefor. 4,372,531, Cl. 251-174.000.
Rom GmbH: *See—*
Vetter, Heinz; and Friederich, Ernst, 4,372,739, Cl. 425-466.000.
Roman, Bernard J.: *See—*
Reichmanis, Elsa; Roman, Bernard J.; Tai, King L.; and Wilkins, Cletus W., Jr., 4,373,018, Cl. 430-312.000.
Rooney, John F.; and Pindell, Robert G., to Texaco Inc. Method and sampler for collecting a non-pressurized well fluid sample. 4,372,382, Cl. 166-264.000.
Roope, John R., Jr. Tool and parts catcher for boats. 4,372,243, Cl. 114-364.000.
Roper Corporation: *See—*
Goertzen, Gerold G.; and Herscher, Lee R., 4,372,397, Cl. 172-42.000.
Roper, Daniel W.: *See—*
Wiers, John W.; Roper, Daniel W.; and Johnson, Richard F., 4,372,612, Cl. 297-374.000.
Rosaen, Borje O.; and Fosdick, Dale P. Filter device with air bleed. 4,372,855, Cl. 210-316.000.
Rose, Leslie C.: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 4,372,389, Cl. 166-369.000.
Rosenberg, Avner: *See—*
Rosenberg, Peretz; and Rosenberg, Avner, 4,372,586, Cl. 285-178.000.
Rosenberg, Peretz; and Rosenberg, Avner. Rod clamp particularly useful as pipe coupling. 4,372,586, Cl. 285-178.000.
Rosenhauch, Irwin; and Ellis, Gary D., to Dresser Industries, Inc. Blowout preventer. 4,372,527, Cl. 251-1.00A.
Ross Operating Valve Company: *See—*
Cameron, Russell J., 4,372,202, Cl. 100-53.000.
Ross, Sidney D.: *See—*
Finkelstein, Manuel; Ross, Sidney D.; and Dunkl, Franz S., 4,373,176, Cl. 361-433.000.
Finkelstein, Manuel; Dunkl, Franz S.; and Ross, Sidney D., 4,373,177, Cl. 361-433.00A.
Ross, William L. Printing apparatus. 4,372,695, Cl. 400-119.000.
Rosswag, Helmut, to Schenk-Filterbau Gesellschaft mit beschrankter Haftung. Electrolyte solution for electropolishing. 4,372,831, Cl. 204-129.800.
Rothrock, Elmer W., to Chicago Bridge & Iron Company. Liquid storage tank. 4,372,340, Cl. 137-576.000.
Rothrock, Mark D.: *See—*
Caruthers, John E.; Jay, Robert L.; Riffel, Ronald E.; and Rothrock, Mark D., 4,372,157, Cl. 73-147.000.
Rozner, Alexander G.; and Helms, Horace H., to United States of America, Navy. Molten metal-liquid explosive method. 4,372,213, Cl. 102-301.000.
Ruffer, Dennis A.: *See—*
Marshall, John P.; and Ruffer, Dennis A., 4,373,186, Cl. 364-551.000.
Ruffino, Paule. Device for filing miscellaneous items of information. 4,372,067, Cl. 40-360.000.
Ruhrchemie Aktiengesellschaft: *See—*
Hibbel, Josef; Schleper, Bernard; and Scheve, Heinrich, 4,372,253, Cl. 122-7.00R.
Runge, Richard J.: *See—*
Gassaway, Gary S.; Scott, William R.; and Runge, Richard J., 4,373,197, Cl. 367-36.000.
Ruprecht, David R.: *See—*
Klee, David J.; Lovette, Norris G., Jr.; Ruprecht, David R.; Boyle, John F.; and Mullane, John C., Jr., 4,372,130, Cl. 62-330.000.
Rushing, Kyle W., to Gustafson, Inc. Treated peanut seeds. 4,372,080, Cl. 47-57.600.
Russell, Frank S.; and Simonelli, Robert J., to Sleeper & Hartley Corp. Wire coiling machine. 4,372,141, Cl. 72-131.000.
Russell, Raymond J., to Panelgraphic Corporation. [Non-photoinitiallo] non-photocatalyzed dipentaerythritol polyacrylate based coating compositions exhibiting high abrasion resistance. 4,373,007, Cl. 428-412.000.
Russell, Richard G.: *See—*
Goforth, Melvin L.; and Russell, Richard G., 4,372,475, Cl. 228-170.000.
Russell, Robert L.: *See—*
Mitchell, Terry L.; and Russell, Robert L., 4,372,480, Cl. 232-28.000.
Rutgerswerke Aktiengesellschaft: *See—*
Moraw, Klaus; and Paul, Hans-Gunther, 4,373,038, Cl. 523-156.000.
Ruti-Te Strake B.V.: *See—*
Van Mullekom, Hubert P., 4,372,349, Cl. 139-452.000.
Van Mullekom, Hubert P., 4,372,498, Cl. 242-47.010.
Rutledge, Donald R.: *See—*
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., 4,372,535, Cl. 254-319.000.
Ryan, James W. Novel radioassay procedure. 4,372,941, Cl. 424-1.000.
Saab-Scania Aktiebolag: *See—*
Bernhardsson, Ake A.; and Svensson, Kent A., 4,372,276, Cl. 123-525.000.
Gillbrand, Per S.; Axelson, Simon E.; and Jiewertz, Sten R., 4,372,119, Cl. 60-600.000.
Saarbergwerke Aktiengesellschaft: *See—*
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.
Saffran, Edward P., to Envirex Inc. Disc for aeration of sewage. 4,372,895, Cl. 261-92.000.
Sahay, Ravi B., to Xerox Corporation. Variable power fuser control. 4,372,675, Cl. 355-14.0FU.
Sailers, Earl L., III: *See—*
King, Allen D., Jr.; King, Robert B.; and Sailers, Earl L., III, 4,372,833, Cl. 204-157.10R.
Saint-Gobain Vitrage: *See—*
Krasborn, Gottfried; Roentgen, Paul; Meier, Wilhelm; and Erdweg, Josef, 4,373,130, Cl. 219-203.000.
Saito, Kenichi: *See—*
Yoshikumi, Chikao; Fujii, Takayoshi; Saito, Kenichi; Fujii, Masahiko; and Niimura, Koichi, 4,372,890, Cl. 260-429.00R.
Saitoh, Shinji, to Vlsi Technology Research Association. Method for producing a semiconductor device. 4,372,030, Cl. 29-569.00R.
Saitou, Sinichi: *See—*
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Sakamaki, Hisashi: *See—*
Tomosada, Masahiro; Kimura, Yoshimasa; and Sakamaki, Hisashi, 4,372,673, Cl. 355-14.00R.
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, to Sumitomo Naugatuck Co. Ltd. Elastomeric composition. 4,373,063, Cl. 525-64.000.
Salk Institute For Biological Studies, The: *See—*
Brown, Marvin R.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,372,884, Cl. 260-112.50S.
Sallenbach, M. Douglas, to Avery International Corp. Streamlined label verification technique. 4,372,681, Cl. 356-72.000.
Salter, Robert S.; Boormaa, Roy S.; and Gilders, Ross D., to Provincial Holdings Ltd. Recovery of lead and silver from minerals and process residues. 4,372,782, Cl. 75-118.00R.
Sambarino, Emilio: *See—*
Fossi, Paolo; and Sambarino, Emilio, 4,372,922, Cl. 423-112.000.
Samples, Randall H.: *See—*
Hilbert, Lloyd E.; and Samples, Randall H., 4,372,891, Cl. 260-453.05P.
Samuels, Stanley: *See—*
Fish, Irving; Schwartz, Stephen A.; and Samuels, Stanley, 4,372,974, Cl. 424-319.000.
Samuelson, Hans O.; and Abrahamsson, Kjell E., to Mo och Domsjo Aktiebolag. Alkaline oxygen delignification and bleaching of cellulose pulp in the presence of aromatic diamines. 4,372,811, Cl. 162-38.000.
Sandberg, Glenn A., to Formax, Inc. Food patty molding machine with multi-orifice fill passage and stripper plate. 4,372,008, Cl. 17-32.000.
Sanders, David E., to E-Systems, Inc. Fast updating peak detector circuit. 4,373,141, Cl. 307-351.000.
Sanders, Edward. Archery bow with arrow support. 4,372,282, Cl. 124-24.00R.
Sanders, Frank. Fireplace log separator. 4,372,596, Cl. 294-9.000.
Sanderson, Roger S.; and Whelchel, Robert C. Sterilized storage container. 4,372,921, Cl. 422-300.000.
Sanderson, William G.; Sumner, Richard B.; and Kragh, Loren G., to Tower Systems Inc. Dual sheet capillary heat exchanger. 4,372,897, Cl. 261-153.000.

Sandillon, Bernard, to Lutelec Lachaire Equipement. Device for shot-blasting hollow parts of large dimensions. 4,372,140, Cl. 72-53.000.
Sandoz Ltd.: *See*—
Ott, Hans, 4,372,956, Cl. 424-251.000.
Sano, Isao; and Kanamori, Hiroshi, to Nissan Motor Co., Ltd. Stop indicator arrangement for an automotive vehicle. 4,373,153, Cl. 340-87.000.
Sano, Shoichi: *See*—
Onada, Isao; and Sano, Shoichi, 4,372,365, Cl. 152-158.000.
Sano, Takashi: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.
Sanraku-Ocean Co., Ltd.: *See*—
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,373,094, Cl. 536-6.400.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwai, Tomio, 4,372,258, Cl. 123-73.0AD.
Saraisky, Alfred. Inserts for use with web dispensing means. 4,372,500, Cl. 242-55.000.
Saran, Herbert; Witthaus, Martin; Smulders, Eduard; and Schwadtke, Karl, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of a stable, readily soluble granulate with a content of bleach activators. 4,372,868, Cl. 252-102.000.
Sarcia, Domenico S., to Oerlikon-Buhrle U.S.A. Inc. In-line cryogenic refrigeration apparatus operating on the Stirling cycle. 4,372,128, Cl. 62-6.000.
Sarre, Olga: *See*—
Ganguly, Ashit K.; Sarre, Olga; and Liu, Yi-Tsung, 4,373,095, Cl. 536-7.100.
Sarto, Jorma O., to Chrysler Corporation. Pre-start engine heat system. 4,372,261, Cl. 123-142.50E.
Sartori, Eugene F.; and Uhrhane, Francis J., to Bell Telephone Laboratories, Incorporated. Maintenance termination device. 4,373,121, Cl. 179-175.30F.
Sato, Hideyori; Inaba, Nobuaki; and Shinohara, Shigeru, to Kabushiki Kaisha Komatsu Seisakusho. Flow divider valve assembly. 4,372,335, Cl. 137-101.000.
Sato, Hisato: *See*—
Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, 4,372,871, Cl. 252-299.610.
Sato, Toshio; Suzuki, Sho; and Ohmura, Hidemasa, to Kao Soap Co., Ltd. Color deepening agent. 4,373,053, Cl. 524-457.000.
Satoh, Ken: *See*—
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, 4,372,504, Cl. 242-198.000.
Satoh, Nobuo: *See*—
Takizawa, Junichi; Kojima, Seiichiro; Satoh, Nobuo; and Nakazato, Eiji, 4,372,578, Cl. 280-802.000.
Satoo, Masaharu, to Yoshida Kogyo K.K. Stringer tape for slide fasteners. 4,372,999, Cl. 428-193.000.
Sawada, Hiroyuki: *See*—
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, 4,373,107, Cl. 564-473.000.
Sawyer, Richard D.: *See*—
Sederquist, Richard A.; Szydlowski, Donald F.; and Sawyer, Richard D., 4,372,759, Cl. 55-73.000.
Sazhin, Gennady V.: *See*—
Surovikin, Vitaly F.; Rogov, Alexandr R.; Sazhin, Gennady V.; and Gorjunov, Georgy L., 4,372,936, Cl. 423-450.000.
Scapple, Robert Y.; Keister, Frank Z.; Grieger, Robert G.; and Himmel, Richard P., to Hughes Aircraft Company. Large area hybrid microcircuit assembly. 4,372,037, Cl. 29-613.000.
Schaefer, Edward: *See*—
O'Connor, Donald T.; Lorenzi, Donald E.; Flaherty, John J.; and Schaefer, Edward, 4,372,658, Cl. 354-63.000.
Scharer, Hans R.: *See*—
Gooch, Kendrick J.; Scharer, Hans R.; and Winter, William, 4,372,736, Cl. 425-149.000.
Schayes, Raymond G. G.: *See*—
Gustin, Pol A. G. J.; and Schayes, Raymond G. G., 4,372,045, Cl. 29-846.000.
Schenk-Filterbau Gesellschaft mit beschrankter Haftung: *See*—
Rosswag, Helmut, 4,372,831, Cl. 204-129.800.
Scheps, Marcy L.: *See*—
Chang, Tiang-Shing; Zientek, Lucy J.; Viningauz, Arthur; and Scheps, Marcy L., 4,373,036, Cl. 523-120.000.
Schering Aktiengesellschaft: *See*—
Bolze, Manfred; and Drawert, Manfred, 4,373,085, Cl. 528-291.000.
Schering Corporation: *See*—
Ganguly, Ashit K.; Sarre, Olga; and Liu, Yi-Tsung, 4,373,095, Cl. 536-7.100.
Scheve, Heinrich: *See*—
Hibbel, Josef; Schleper, Bernard; and Scheve, Heinrich, 4,372,253, Cl. 122-7.00R.
Schilling, Franz, to Sfena. Process for eliminating errors in prepositioning pieces to be manufactured by electro-erosion. 4,373,126, Cl. 219-69.00M.
Schimmel, Karl F.: *See*—
Seiner, Jerome A.; and Schimmel, Karl F., 4,373,083, Cl. 528-67.000.
Schirmer, Ulrich: *See*—
Rohr, Wolfgang; Schirmer, Ulrich; and Wuerzer, Bruno, 4,373,105, Cl. 560-27.000.
Schleicher, Thomas R.: *See*—
Drennan, Denis B.; Maylahn, Donald J.; and Schleicher, Thomas R., 4,372,300, Cl. 128-83.000.
Schleper, Bernard: *See*—
Hibbel, Josef; Schleper, Bernard; and Scheve, Heinrich, 4,372,253, Cl. 122-7.00R.
Schmeling, Robert H. Bag closure. 4,372,363, Cl. 150-4.000.
Schmidt, Arlo R. Fuel vaporizing carburetor. 4,372,275, Cl. 123-522.000.
Schmidt, Gerhard; Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, to EVG Entwicklungs-und-Verwertungs Gesellschaft mbH. Machine for the automatic production of welded lattice girders. 4,372,350, Cl. 140-112.000.
Schmidt, Hans-Joachim: *See*—
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, 4,372,878, Cl. 252-455.00Z.
Schmitt, Joseph J.: *See*—
Haskett, Thomas E.; and Schmitt, Joseph J., 4,373,127, Cl. 219-69.00E.
Schmitt, Werner; Parrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, to Espe Fabrik Parmazeutischer Praparate GmbH. Light curable acrylic dental composition with calcium fluoride pigment. 4,372,836, Cl. 204-159.230.
Schneider, Christian: *See*—
Pohlmann, Erich; and Doetsch, Hans-Peter, 4,372,127, Cl. 62-6.000.
Schnitzler, Peter: *See*—
Gernhardt, Paul; Danguillier, Wilhelm; Peter, Karl; Grams, Wolfgang; Pohl, Siegfried; and Schnitzler, Peter, 4,372,754, Cl. 48-77.000.
Schomburg, Calvin; and Dotts, Robert L., to United States of America, National Aeronautics and Space Administration. High temperature silicon carbide impregnated insulating fabrics. 4,373,003, Cl. 428-241.000.
Schonfelder, Manfred: *See*—
Reichmann, Wolfgang; Konig, Klaus; and Schonfelder, Manfred, 4,373,080, Cl. 528-45.000.
Schonthaler, Karl; and Hartl, Gerhard, to Semperit Aktiengesellschaft. Level crossing for railroads and method of fabricating the same. 4,372,488, Cl. 238-8.000.
Schopen, Joseph L.: *See*—
Miller, Robert A.; Larson, Kenneth W.; and Schopen, Joseph L., 4,372,100, Cl. 53-428.000.
Schroder, Gunter: *See*—
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.
Schrott, Steve. Clean-out tool for sinks and the like. 4,371,991, Cl. 4-255.000.
Schubert, Paul C.; and Thakrar, Anil C., to AMP Incorporated. High voltage flame retardant EPOM insulating compositions. 4,373,048, Cl. 524-371.000.
Schuetzle, Dennis: *See*—
Butler, James W.; Colvin, Alex D.; and Schuetzle, Dennis, 4,372,155, Cl. 73-114.000.
Schuhmann, Reinhardt, Jr.: *See*—
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 4,372,540, Cl. 266-171.000.
Schultz, Gary E.; and Weidner, Albert J., to Sperry Corporation. Indirect address computation circuit. 4,373,182, Cl. 364-200.000.
Schulz, Donald N.: *See*—
Gunesin, Binnur; Hamed, Gary R.; Kang, Jung W.; and Schulz, Donald N., 4,373,068, Cl. 525-218.000.
Schulz, Volkmar: *See*—
Rampel, Hans; Hess, Peter; and Schulz, Volkmar, 4,372,521, Cl. 248-430.000.
Schumacher, Hermann; Molineus, Tilman; and Ridder, Detlef. Pressure sensitive copying material. 4,372,581, Cl. 282-27.500.
Schurger, Ranier: *See*—
Kiener, Heinz; Neder, Gunter; and Schurger, Ranier, 4,372,628, Cl. 308-187.100.
Schwadtke, Karl: *See*—
Saran, Herbert; Witthaus, Martin; Smulders, Eduard; and Schwadtke, Karl, 4,372,868, Cl. 252-102.000.
Schwartz, David M. Solar heat exchanger. 4,372,291, Cl. 126-443.000.
Schwartz, Richard A., to PPG Industries, Inc. Frozen emulsion initiation of polyol (allyl carbonate). 4,373,075, Cl. 526-230.500.
Schwartz, Stephen A.: *See*—
Fish, Irving; Schwartz, Stephen A.; and Samuels, Stanley, 4,372,974, Cl. 424-319.000.
Schwarz, Cornelia: *See*—
Hofbauer, Peter; Gaschler, Erich; and Schwarz, Cornelia, 4,372,257, Cl. 123-68.000.
Sciortino, August M. Self-locking covered coin receptacle and automatic reset mechanism therefor. 4,372,479, Cl. 232-15.000.
Scott, Robert H.: *See*—
Whitten, Charles M.; Scott, Robert H.; and Mansfield, Vaughn, 4,372,756, Cl. 48-202.000.
Scott, William R.: *See*—
Gassaway, Gary S.; Scott, William R.; and Runge, Richard J., 4,373,197, Cl. 367-36.000.
Searle, Robert J. G.: *See*—
Day, Janet A.; and Searle, Robert J. G., 4,372,776, Cl. 71-90.000.
Sebald, Dorothy Davis, executrix: *See*—
Sebald, Joseph F., deceased, 4,372,126, Cl. 60-669.000.

Sebald, Joseph F., deceased (by Sebald, Dorothy Davis, executrix), to Heat Power Products Corporation. Closed cycle system for generating usable energy from waste heat sources. 4,372,126, Cl. 60-669.000.
Sebestyen, Gyula: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Sechi, Lucio, to Danieli & C. Officine Meccaniche S.p.A. Motor vehicle for use on roads and railways. 4,372,220, Cl. 105-215.00C.
SEDCO, Inc.: *See*—
Hammett, Dillard S., 4,372,395, Cl. 169-69.000.
Sederquist, Richard A.; Szydlowski, Donald F.; and Sawyer, Richard D., to United Technologies Corporation. Electrolyte vapor condenser. 4,372,759, Cl. 55-73.000.
Seeger, Gunter: *See*—
Wiemann, Dieter; Seeger, Gunter; and Gretes, Berndt, 4,372,899, Cl. 264-25.000.
Segard, Emile: *See*—
Berneman, Armand; David, Alain; Horaud, Florian; and Segard, Emile, 4,373,027, Cl. 435-240.000.
Seidel, Michael J.; and Dixon, Kevin L. Method for making enamel beads and resulting product. 4,372,993, Cl. 427-193.000.
Seiner, Jerome A.; and Schimmel, Karl F., to PPG Industries, Inc. Process of making urethane rheology modifiers. 4,373,083, Cl. 528-67.000.
Seipp, Ulrich; Vollenberg, Werner; Mueller, Bernd; and Michel, Gudrun, to Gruenenthal GmbH. Heterocyclic prostaglandin type compounds, medicaments containing them and processes for the preparation and use of these heterocyclic compounds and medicaments. 4,372,971, Cl. 424-285.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Shogenobu, 4,372,529, Cl. 251-151.000.
Semperit Aktiengesellschaft: *See*—
Schonthaler, Karl; and Hartl, Gerhard, 4,372,488, Cl. 238-8.000.
Serganoli, Enzo, to G. D. Societa' per Azioni. Manufacturing machine for producing two continuous cigarette rods. 4,372,326, Cl. 131-84.00B.
Sergeant, Timothy L., to Kendall Company, The. Diaper with blended yarns. 4,372,310, Cl. 128-284.000.
Sewell, James D.; and Gordon, Norman E. Cellular void filler. 4,372,717, Cl. 410-154.000.
Seybold, Guenther: *See*—
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,372,885, Cl. 260-158.000.
Seyfarth, Gerhard: *See*—
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.
Sfena: *See*—
Schilling, Franz, 4,373,126, Cl. 219-69.00M.
Shaffer, John W.; and Gavenonis, Thomas L., to GTE Products Corporation. Pyrotechnic cap with mechanically desensitized composition. 4,372,210, Cl. 102-204.000.
Shannon, James A.; and McClure, B. W. Baseball-pitching machine. 4,372,284, Cl. 124-78.000.
Shapiro, Julius; and Eliason, Andrew, to Hair Free Centers. Impedance sensing epilator. 4,372,315, Cl. 128-303.180.
Sharp Kabushiki Kaisha: *See*—
Osaki, Mikio; and Kita, Sumio, 4,373,164, Cl. 346-75.000.
Yanagiuchi, Shigenobu; and Kanou, Ikuo, 4,373,192, Cl. 364-900.000.
Sharp, Thurman V. Escape device. 4,372,422, Cl. 182-5.000.
Shaw & Slavsky, Inc.: *See*—
Slavsky, Robert J., Sr., 4,372,066, Cl. 40-124.100.
Shell Internationale Research Maatschappij B.V.: *See*—
Hadler, Malcolm R.; Woodward, David R.; and Godfrey, Andrew A., 4,372,970, Cl. 424-282.000.
Shell Oil Company: *See*—
Cornelisse, Roelof, 4,372,925, Cl. 423-226.000.
Davies, David R.; Richardson, Edwin A.; and Van Zanten, Marinus, 4,372,385, Cl. 166-281.000.
Day, Janet A.; and Searle, Robert J. G., 4,372,776, Cl. 71-90.000.
Germaine, Gilbert R.; and Darnanville, Jean P., 4,372,879, Cl. 252-470.000.
McCullough, Glenn R., 4,372,927, Cl. 423-244.000.
Shepard, Steve A.: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,373,193, Cl. 364-900.000.
Sherman, Michael I.: *See*—
Richter, Johan C. F. C.; and Sherman, Michael I., 4,372,711, Cl. 406-63.000.
Sherwood Medical Industries, Inc.: *See*—
Cornell, William D.; Crouther, Ronald; Dyer, Howard P.; and Ranford, Alan B., 4,372,336, Cl. 137-205.000.
Sherwood Selpac Corp.: *See*—
Trinkwalder, Joseph C., Jr., 4,372,343, Cl. 137-614.200.
Shevada, Mike. Bearing pusher. 4,372,024, Cl. 29-260.000.
Shibata, Masaaki: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.
Shibata, Tadayoshi: *See*—
Hara, Yoshio; and Shibata, Tadayoshi, 4,372,660, Cl. 354-180.000.
Shibata, Tsutomu; Kimura, Kenji; Satoh, Ken; Saitou, Sinichi; Kato, Toshikazu; Watanabe, Seizo; and Ohshima, Ken, to Olympus Optical Co., Ltd. Magnetic record tape protective device for a tape cassette. 4,372,504, Cl. 242-198.000.
Shibazaki, Kenji: *See*—
Miyata, Shin; Kono, Tateomi; Shibazaki, Kenji; and Utsunomiya, Yoichi, 4,372,676, Cl. 355-14.00C.
Shichijo, Kojiro. Structure for roofing tile. 4,372,090, Cl. 52-536.000.
Shido, Nobuhiro: *See*—
Yamamoto, Hitoshi; Watanabe, Masaki; and Shido, Nobuhiro, 4,372,417, Cl. 180-215.000.
Shih, David H.: *See*—
Christensen, Burton G.; and Shih, David H., 4,372,965, Cl. 424-274.000.
Shimada Shoji Co., Ltd.: *See*—
Shimada, Yukio, 4,372,998, Cl. 428-193.000.
Shimada, Yukio, to Shimada Shoji Co., Ltd. Heat adhesive tapes for finishing hems of trousers, skirts and like articles. 4,372,998, Cl. 428-193.000.
Shimadzu Corporation: *See*—
Komoto, Akira; and Tsuji, Tomohiro, 4,372,406, Cl. 177-212.000.
Shimamoto, Takeshi; Arai, Kazuo; and Kobayashi, Kazutsugu, to Matsushita Electric Industrial Co., Ltd. Remote game apparatus. 4,372,558, Cl. 273-238.000.
Shimizu, Masami, to Canon Kabushiki Kaisha. Moisture- and dust-proof device for rotating operation part of camera. 4,372,664, Cl. 354-288.000.
Shimizu, Michiro; and Tsunoda, Masakazu, to Nissan Motor Company, Limited. Voice trip information system for an automotive vehicle. 4,373,116, Cl. 179-1.05M.
Shimizu, Ryusaku: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.
Shimonaru, Tuneyoshi: *See*—
Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Tuneyoshi; Takashima, Koichi; and Kato, Yasuhiko, 4,372,846, Cl. 210-86.000.
Shin-Etsu Chemical Co. Ltd.: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokaza, 4,372,986, Cl. 427-40.000.
Shinohara, Shigeru: *See*—
Sato, Hideyori; Inaba, Nobuaki; and Shinohara, Shigeru, 4,372,335, Cl. 137-101.000.
Shionogi & Co., Ltd.: *See*—
Okumura, Tamotsu; and Kadono, Tetsuro, 4,372,850, Cl. 210-198.300.
Shirosaki, Kiyotaka: *See*—
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, 4,372,859, Cl. 210-739.000.
Shirouchi, Shoji: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.
Shiryaev, Grigory V.: *See*—
Sokolov, Sergei S.; Komovsky, Vadim R.; Vlasov, Leonid I.; Boretsky, Boris M.; and Shiryaev, Grigory V., 4,372,121, Cl. 60-606.000.
Shmuter, Shimshon: *See*—
Kaganovsy, Yaacov; Kustanovich, Yosef; Shmuter, Shimshon; Gelfer, Vadim; and Muchnik, Shimon, 4,372,818, Cl. 202-83.000.
Short, Glyn D.; and Whittam, Thomas V., to Imperial Chemical Industries Limited. Zeolite Nu-3. 4,372,930, Cl. 423-326.000.
Shudo, Hirokazu: *See*—
Harigane, Kotaro; Takahashi, Kenichi; Shudo, Hirokazu; and Tando, Shuichi, 4,372,802, Cl. 156-538.000.
Shur, Victor: *See*—
Malachowski, Michael A.; Shur, Victor; and Thettu, Raghulinga R., 4,372,668, Cl. 355-3.00R.
Shutt, Sidney G., to Rockwell International Corporation. Three-axis accelerometer having dynamic bias compensation. 4,372,162, Cl. 73-517.00B.
Shutt, Sidney G., to Rockwell International Corporation. Suspension for three-axis accelerometer. 4,372,520, Cl. 248-604.000.
Sicard, Jean-Paul: *See*—
Matthews, William G.; Sicard, Jean-Paul; and Anderson, Richard A., 4,372,857, Cl. 210-673.000.
Siemens Aktiengeselischaft: *See*—
Dengler, Robert; and Meyer, Franz J., 4,373,171, Cl. 360-71.000.
Franke, Kurt, 4,373,144, Cl. 313-338.000.
Grewal, Virinder; and Reindl, Werner, 4,372,809, Cl. 156-656.000.
Herold, Georg; and Kabs, Hermann, 4,372,907, Cl. 264-265.000.
Menzel, Guenther, 4,372,989, Cl. 427-53.100.
Siemens-Allis, Inc.: *See*—
Bollinger, Parker A., Jr., 4,372,180, Cl. 74-606.00R.
Sigel, Carl W.: *See*—
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,372,957, Cl. 424-251.000.
Silber, Philip. Article of clothing having built-in bust support. 4,372,320, Cl. 128-455.000.
Silberberg, Joseph: *See*—
Jung, Alfred K.; Silberberg, Joseph; and Weil, Edward D., 4,373,103, Cl. 544-195.000.
Silkensen, Ralph D.: *See*—
Robinson, Neil L.; and Silkensen, Ralph D., 4,373,173, Cl. 360-121.000.
Simay, Antal: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen,

Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Simeonoff, George. Sectional wall form system. 4,372,522, Cl. 249-18.000.
Simeth, Claus: *See*—
Herzan, Georg; and Simeth, Claus, 4,372,204, Cl. 101-145.000.
Simmons U.S.A. Corporation: *See*—
Callaway, Milton A., 4,371,998, Cl. 5-451.000.
Simonds, Gary; and McKee, Arnold D., to Victor United, Inc. Adjustable cable end bracket for compound bow. 4,372,285, Cl. 124-90.000.
Simonelli, Robert J.: *See*—
Russell, Frank S.; and Simonelli, Robert J., 4,372,141, Cl. 72-131.000.
Simonis, Jurgen; and Czok, Helmut, to Gebruder Welger GmbH & Co. Kommanditgesellschaft. Pick-up baler for agricultural material. 4,372,104, Cl. 56-341.000.
Simpkin, Gordon T.: *See*—
Cross, Raymond P.; and Simpkin, Gordon T., 4,372,774, Cl. 65-114.000.
Simpson, Harold G., to Star Manufacturing Co. Construction system and fastener therefore. 4,372,014, Cl. 24-201.00C.
Sims, Larry A.: *See*—
Grossmann, Frederic; and Sims, Larry A., 4,372,303, Cl. 128-132.00D.
Singer, Arnold H.; and Holm, Ronald T., to United States of America, Navy. Multiple thin film absorption of reflected substrate modes in waveguide system. 4,372,642, Cl. 350-96.120.
Singer, Arnold J.: *See*—
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,372,977, Cl. 424-342.000.
Singer Company, The: *See*—
Dunn, William H.; and Horey, Leonard I., 4,372,232, Cl. 112-158.00E.
Glore, Thomas G., 4,372,358, Cl. 144-117.00R.
Killinger, Karl H.; Johnson, Kenneth M.; and Totino, Peter J., 4,372,234, Cl. 112-258.000.
Larsen, Robert H.; and Giaimo, Anthony, 4,372,502, Cl. 242-149.000.
Odermann, Charles R.; and Wurst, John W., 4,372,231, Cl. 112-158.00B.
Odermann, Charles R., 4,372,233, Cl. 112-235.000.
Szostak, Jan, 4,372,703, Cl. 403-324.000.
Totino, Peter J.; and Davidson, Donald R., 4,372,237, Cl. 112-308.000.
Vermillion, Don W., 4,372,004, Cl. 15-182.000.
Sioli, Giancarlo: *See*—
Spaziante, Placido M.; and Sioli, Giancarlo, 4,372,827, Cl. 204-95.000.
Six, Volker: *See*—
Koster, Robertus J. C.; Six, Volker; and Hale, Peter, 4,372,882, Cl. 252-529.000.
SKF Kugellagerfabriken GmbH: *See*—
Kiener, Heinz; Neder, Gunter; and Schurger, Ranier, 4,372,628, Cl. 308-187.100.
Skinner, Neal G., to Halliburton Company. Subsurface control valve. 4,372,388, Cl. 166-334.000.
Skyba, Dorothea, legal representative: *See*—
Wiener, Dieter; Sulzer, Gerd; Skyba, Rudolf, deceased; and Pomp, Jurgen, 4,372,085, Cl. 51-216.0ND.
Skyba, Rudolf, deceased: *See*—
Wiener, Dieter; Sulzer, Gerd; Skyba, Rudolf, deceased; and Pomp, Jurgen, 4,372,085, Cl. 51-216.0ND.
Skypala, Louis M., to Budd Company, The. Wire raceway for attachment under the floor of a railway car. 4,372,510, Cl. 248-58.000.
Slager, Ralph E.: *See*—
Black, John W.; and Slager, Ralph E., 4,372,738, Cl. 425-451.900.
Slavsky, Robert J., Sr., to Shaw & Slavsky, Inc. Highlighting marker for merchandise price sign. 4,372,066, Cl. 40-124.100.
Sleeper & Hartley Corp.: *See*—
Russell, Frank S.; and Simonelli, Robert J., 4,372,141, Cl. 72-131.000.
Small, Eugene D. Cotton treating process. 4,372,002, Cl. 8-156.000.
Smies, Frederic D.: *See*—
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,372,861, Cl. 252-29.000.
Smith, Abbott: *See*—
Carpenter, Vance J.; and Smith, Abbott, 4,372,670, Cl. 355-8.000.
Smith, Aubrey C., Jr.: *See*—
Chao, Tai S.; Smith, Aubrey C., Jr.; and Smies, Frederic D., 4,372,861, Cl. 252-29.000.
Smith, Gerald J.; and Adams, Ronald W., to Albany International Corp. Molded textile air conditioning and heat duct. 4,373,001, Cl. 428-212.000.
Smith International, Inc.: *See*—
Neilson, William J., 4,372,624, Cl. 384-94.000.
Smith, Jimmie L. Roof cooling system. 4,372,493, Cl. 239-208.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; and Miles, Peter D., 4,372,963, Cl. 424-272.000.
Smith, Michael B.; and Nolte, Kenneth G., to Standard Oil Company (Indiana). Method for determination of fracture closure pressure. 4,372,380, Cl. 166-250.000.
Smith, Michael C. Air drag reducing tail gate. 4,372,601, Cl. 296-50.000.
Smith, Richard D. Molded base plate for rollerskates attachable to shoes. 4,372,566, Cl. 280-11.190.
Smith, Rodney D. High temperature and high pressure fuel injection apparatus for internal combustion engines. 4,372,278, Cl. 123-557.000.
Smulders, Eduard: *See*—
Saran, Herbert; Witthaus, Martin; Smulders, Eduard; and Schwadtke, Karl, 4,372,868, Cl. 252-102.000.
Snider, Kenneth D.: *See*—
Haasl, Michael J.; Snider, Kenneth D.; and Murphy, William L., 4,372,982, Cl. 426-549.000.
Snow, Robert E.: *See*—
Lawver, James E.; McClintock, Walter O.; and Snow, Robert E., 4,372,843, Cl. 209-12.000.
Snyder, Clair W., Jr.: *See*—
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., 4,372,634, Cl. 339-17.00C.
Snyder, William R.; and Feuerstein, Diane, to Betz Laboratories, Inc. Method and composition for treating aqueous mediums. 4,372,870, Cl. 252-180.000.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
Gauvain, Roger, 4,372,010, Cl. 19-159.00R.
Societe Anonyme D.B.A.: *See*—
Delaunay, Jean; and Le Marchand, Claude, 4,372,428, Cl. 188-73.350.
Societe Anonyme Dite: Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,372,969, Cl. 424-282.000.
Societe Anonyme Parinter: *See*—
Berend, Francis T., 4,371,988, Cl. 2-167.000.
Societe d'Applications des Machines Motrices: *See*—
Devaud, Gerard L., 4,372,702, Cl. 403-24.000.
Societe D'Assistance Technique Pour Produits Nestle S.A.: *See*—
Bauer, Heinz, 4,372,984, Cl. 426-637.000.
Societe de Fabrication d'Instruments de Mesure (S.F.I.M.): *See*—
Gogniat, Guy; and Grobois, Jacques, 4,372,160, Cl. 73-178.00R.
Societe Industrielle Bertrand Faure: *See*—
Boisset, Bernard, 4,372,609, Cl. 297-362.000.
Sohler, Lawrence J. Electrical connector for tapping into a fuse block. 4,372,638, Cl. 339-273.00F.
Sokolov, Sergei S.; Komovsky, Vadim R.; Vlasov, Leonid I.; Boretsky, Boris M.; and Shiryaev, Grigory V. Power-plant. 4,372,121, Cl. 60-606.000.
Solar Kinetics, Inc.: *See*—
Hutchison, Joseph A., 4,372,027, Cl. 29-448.000.
Hutchison, Joseph A., 4,372,651, Cl. 350-292.000.
Sonco Wholesale Fence Inc.: *See*—
Long, Clyde A., 4,372,992, Cl. 427-185.000.
Sonoi, Hidekazu: *See*—
Tamura, Shoichi; Asami, Takayoshi; and Sonoi, Hidekazu, 4,372,765, Cl. 62-29.000.
Sorensen, Roald H. Basketball backboard. 4,372,555, Cl. 273-1.50R.
Soula, Gerard, to Rhone-Poulenc Industries. Sequestering agents. 4,373,070, Cl. 525-332.200.
Source Technology, Inc.: *See*—
Narasimhan, Mandayam J., Jr.; and Thirmulachar, Mandayam J., 4,372,753, Cl. 44-52.000.
Southwire Company: *See*—
Starnes, Ralph E., Jr., 4,372,539, Cl. 266-104.000.
Soutwire Company: *See*—
Chia, E. Henry, 4,372,542, Cl. 266-229.000.
Spang Industries, Inc.: *See*—
Yu, Bu-Fan B.; and Goldman, Alex, 4,372,865, Cl. 252-62.620.
Spare Trunk Corporation: *See*—
Campbell, James H., 4,372,568, Cl. 280-63.000.
Spartanics, Ltd.: *See*—
Mohan, William L.; Willits, Samuel P.; and Kleeman, Thomas E., 4,373,135, Cl. 377-8.000.
Spaziante, Placido M.; and Sioli, Giancarlo, to Panclor S.A. Novel horizontal diaphragmless electrolyzer. 4,372,827, Cl. 204-95.000.
Spector, George: *See*—
Benenate, Louis; and Spector, George, 4,372,064, Cl. 37-117.500.
Stover, Henry D., Jr.; and Spector, George, 4,372,198, Cl. 99-340.000.
Speranza, George P.; Cuscurida, Michael; and Zimmerman, Robert L., to Texaco Inc. Modification of polyols with epoxy resins for use in flexible polyurethane foams. 4,373,034, Cl. 521-177.000.
Sperry Corporation: *See*—
Allen, Terry S.; and Jacobson, Peter E., 4,372,633, Cl. 339-5.00M.
De Coene, Frans J. G. C.; Naaktgeboren, Adrianus; and Vansteelant, Marc G., 4,372,723, Cl. 414-111.000.
Linde, James P., 4,373,180, Cl. 364-200.000.
McIlwain, Irwin D.; and McDuffie, James W., 4,372,103, Cl. 56-14.400.
Schultz, Gary E.; and Weidner, Albert J., 4,373,182, Cl. 364-200.000.
Vansteelant, Marc G., 4,372,588, Cl. 289-8.000.
Vansteelant, Marc G., 4,372,589, Cl. 289-13.000.
Villa, Paul Y.; and Day, Alvin D., 4,372,632, Cl. 312-311.000.
Spin Physics, Inc.: *See*—
Bagby, John F., 4,372,036, Cl. 29-603.000.
Sprague Electric Company: *See*—
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Berman, Herbert L.; and Sprout, James C., 4,372,690, Cl. 374-29.000.

Stacy, Carl J.: *See*—
Wood, Jerold D.; and Stacy, Carl J., 4,373,041, Cl. 524-77.000.
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Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
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Stafford, Donald C., to Chicago Bridge & Iron Company. Ball and socket joint with fluid flow capability through the joint. 4,372,344, Cl. 137-615.000.
Stanczak, Edmund A.; and Ringe, Stephen J., to Fruehauf Corporation. Double pivot door for cargo vehicles. 4,372,603, Cl. 296-146.000.
Standard-Keil Hardware Mfg. Co., a Division of Builders Inc.: *See*—
Cook, Sanford L.; Molinani, Justin J.; and Dennison, Kenneth I., Jr., 4,372,591, Cl. 292-221.000.
Standard Oil Company (Indiana): *See*—
Smith, Michael B.; and Nolte, Kenneth G., 4,372,380, Cl. 166-250.000.
Stankiewicz, Jerzy: *See*—
Winkler, Jerzy; and Stankiewicz, Jerzy, 4,373,113, Cl. 174-179.000.
Star Manufacturing Co.: *See*—
Kim, Kwon S., 4,372,901, Cl. 264-46.500.
Simpson, Harold G., 4,372,014, Cl. 24-201.00C.
Starnes, Ralph E., Jr., to Southwire Company. Renewable, strand centering annealer sheave. 4,372,539, Cl. 266-104.000.
Starp, Franz; and Rittmann, Dieter. Diaphragm setting device for photographic camera. 4,372,662, Cl. 354-273.000.
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Landa, Vaclav; Vitek, Jaromir; Nejedly, Pavel; Holpuch, Vladimir; Bubelis, Juozas; and Stepanovicius, Atanas-Nemezyus, 4,372,826, Cl. 204-43.00T.
Stauffer Chemical Company: *See*—
Jung, Alfred K.; Silberberg, Joseph; and Weil, Edward D., 4,373,103, Cl. 544-195.000.
Steer, Peter L.; and Edwards, John V., to Kingsdown Medical Consultants Ltd. Ostomy bag including filter means. 4,372,308, Cl. 128-283.000.
Steiling, Vigil, to Globe Machine Manufacturing Company. Machine for profiling wood panel to simulate lap siding. 4,372,357, Cl. 144-114.00R.
Steinbrecher, Lester; and Hall, Wilbur S., to Amchem Products, Inc. Process and composition for coating metals. 4,373,050, Cl. 524-405.000.
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Larsson, Lars-Ake L.; Gullberg, Claes-Ake; Stenberg, Kaj; and Boberg, Nils G. E., 4,372,484, Cl. 494-14.000.
Stenger, Antoine: *See*—
Mouzin, Gilbert; Cousse, Henri; Stenger, Antoine; and Casadio, Sylvano, 4,372,975, Cl. 424-324.000.
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Helgstrand, Ake J. E.; Johannson, Karl N.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran, 4,372,894, Cl. 260-941.000.
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Stephens, Donald E.; and Ehret, Robert J., to Beckman Instruments, Inc. Flow monitoring method and apparatus. 4,372,150, Cl. 73-40.50R.
Stephens, Frank M., Jr.: *See*—
Tolman, Radon; and Stephens, Frank M., Jr., 4,372,755, Cl. 48-197.00R.
Stephens, Geoffrey B.: *See*—
Bergeron, D. L.; Fleming, Daniel J.; and Stephens, Geoffrey B., 4,373,166, Cl. 357-15.000.
Sterling Drug Inc.: *See*—
Brandenburg, Bruce L.; and Bauer, Gerald L., 4,372,940, Cl. 423-567.00A.
Diana, Guy D., 4,372,976, Cl. 424-331.000.
Stern, Harold; and Suleiman, Elisabeth, to International Playtex, Inc. Brassiere. 4,372,322, Cl. 128-491.000.
Sternberg, James C., to Beckman Instruments, Inc. Photometer with rotating sample container. 4,372,683, Cl. 356-338.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Dolenc, Anton; and Visek, Tomas, 4,372,179, Cl. 74-579.00E.
Stiernspetz, Allan, to Datasaab AB. Device and a method for withdrawing articles in the form of sheets from a stack of articles. 4,372,549, Cl. 271-23.000.
Stillman, Gordon B.; and White, Charles R., to General Electric Company. Submersible equipment handling system. 4,372,597, Cl. 294-67.0DA.
Stockman, Richard F., to Air Preheater Company, Inc., The. Rotor support. 4,372,370, Cl. 165-8.000.
Stolzer Lagertechnik Gesellschaft mit beschrankter Haftung: *See*—
Stolzer, Paul, 4,372,724, Cl. 414-281.000.
Stolzer, Paul, to Stolzer Lagertechnik Gesellschaft mit beschrankter Haftung. Apparatus and method for storing rod stock and supplying same to a servicing machine. 4,372,724, Cl. 414-281.000.
Stone Container Corp.: *See*—
Konopko, Matthew S., 4,372,446, Cl. 206-586.000.
Stover, Henry D., Jr.; and Spector, George. Lantern hot plate. 4,372,198, Cl. 99-340.000.
Stow/Davis Furniture Company: *See*—
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., 4,372,629, Cl. 312-223.000.
Strahan, Virgil H.; James, Kenneth A.; and Quick, William H., to Rockwell International Corporation. Birefringent electromagnetic transmission line that preserves the state of polarized radiation propagating therein. 4,372,646, Cl. 350-96.310.
Stramentinoli, Giorgio; and Gennari, Federico, to BIORESEARCH S.r.l. Process for preparing adenosine derivatives of anti-inflammatory and analgesic activity. 4,373,097, Cl. 536-26.000.
Stratta, John G.: *See*—
Stratta, Peter J.; Stratta, John G.; and Camp, Douglas M., 4,372,006, Cl. 16-105.000.
Stratta, Peter J.; Stratta, John G.; and Camp, Douglas M., to Harbor Tool Mfg. Inc. Freight door roller housing. 4,372,006, Cl. 16-105.000.
Straub, Harold E.: *See*—
Dehart, Marv L.; Kloostra, M. Leon; and Straub, Harold E., 4,372,170, Cl. 73-861.610.
Strauss, Harry W.; Callahan, Ronald J.; and Froelich, Jerry W., to Massachusetts General Hospital, The. Method and apparatus for radiolabeling red blood cells. 4,372,294, Cl. 128-1.100.
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Hanson, Paul A.; Hightower, John D.; and Strickland, Alvah T., 4,372,359, Cl. 114-244.000.
Stroup, John F.; Robins, Harold J.; and Teeple, Michael, to Van Dorn Company. Method for molding hollow plastic articles. 4,372,910, Cl. 264-532.000.
Stuart, James M. Weight, volume or density measuring system. 4,372,405, Cl. 177-25.000.
Stubblefield, Jerry D. Shoe sole construction. 4,372,058, Cl. 36-32.00R.
Studley, Charles F., Jr.: *See*—
Moore, Michael J.; and Studley, Charles F., Jr., 4,372,725, Cl. 414-460.000.
Stuntz, Gordon F.; and Bearden, Roby, to Exxon Research and Engineering Co. Process for reducing coke formation in heavy feed catalytic cracking. 4,372,841, Cl. 208-113.000.
Stuntz, Gordon F.: *See*—
Bearden, Roby; and Stuntz, Gordon F., 4,372,840, Cl. 208-113.000.
Sturgeon, Philip L.: *See*—
Clyne, Nicholas; Sturgeon, Philip L.; and Wright, Lawrence H., 4,373,133, Cl. 235-383.000.
Sturmer, Walter: *See*—
von der Decken, Claus-Benedict; Hantke, Hans-Jurgen; and Sturmer, Walter, 4,372,912, Cl. 376-381.000.
Suda, Hitoshi: *See*—
Fujii, Takayuki; and Suda, Hitoshi, 4,372,412, Cl. 180-90.000.
Sugalski, Raymond K.; Leduc, Kenneth C.; and Morris, Jesse L., to General Electric Company. Apparatus for assembling and welding vented cell covers. 4,373,129, Cl. 219-79.000.
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, to Hitachi, Ltd.; and Hitachi Kyowa Kogyo, Ltd. Method of removing minuscule solid particles from liquid and system therefor. 4,372,859, Cl. 210-739.000.
Sugimura, Mitsuo: *See*—
Tarumi, Niro; Sugimura, Mitsuo; Komiya, Shigeo; and Tsuchiya, Makoto, 4,373,076, Cl. 526-261.000.
Sugiura, Hiroaki: *See*—
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,372,909, Cl. 264-521.000.
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, to Kobe Steel, Ltd. Iron ore pellets containing coarse ore particles. 4,372,779, Cl. 75-0.50R.
Suleiman, Elisabeth: *See*—
Stern, Harold; and Suleiman, Elisabeth, 4,372,322, Cl. 128-491.000.
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Wiener, Dieter; Sulzer, Gerd; Skyba, Rudolf, deceased; and Pomp, Jurgen, 4,372,085, Cl. 51-216.0ND.
Sumeghy, Zoltan: *See*—
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, 4,373,104, Cl. 546-145.000.
Sumitomo Naugatuck Co. Ltd.: *See*—
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,373,063, Cl. 525-64.000.
Summers, Ann. Educational game for student and/or graduate nurses. 4,372,559, Cl. 273-243.000.
Sumner, Richard B.: *See*—
Sanderson, William G.; Sumner, Richard B.; and Kragh, Loren G., 4,372,897, Cl. 261-153.000.
Sunaga, Yoshimitsu; and Honda, Satoru, to Pioneer Electronic Corporation. Playback mode switching circuit for tape recorder. 4,373,170, Cl. 360-71.000.
Sunds Defibrator AB: *See*—
Bystedt, Hjalmar S. L., 4,372,810, Cl. 162-23.000.
Superfos Glasuld A/S (Superfos A/S): *See*—
Rasmussen, Lauritz B. L., 4,372,799, Cl. 156-285.000.
Supik, Helmuth, to Continental Group, Inc., The. Annealing of end rim. 4,372,719, Cl. 413-9.000.
Surgant, John M.: *See*—
LeClair, Francis J.; and Surgant, John M., 4,372,777, Cl. 71-93.000.
Surgikos, Inc.: *See*—
Brasfield, Bernard M., 4,371,987, Cl. 2-162.000.
Surovikin, Vitaly F.; Rogov, Alexandr R.; Sazhin, Gennady V.; and Gorjunov, Georgy L. Process for producing carbon black. 4,372,936, Cl. 423-450.000.

Sutterlin, Norbert: *See*—
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.
Suzuki, Keiichi, to Kabushiki Kaisha Daini Seikosha. Method of making a switching electrode portion of a PCB. 4,372,046, Cl. 29-852.000.
Suzuki, Noboru: *See*—
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,372,457, Cl. 215-228.000.
Suzuki, Sho: *See*—
Sato, Toshio; Suzuki, Sho; and Ohmura, Hidemasa, 4,373,053, Cl. 524-457.000.
Yagi, Kazuhisa; Suzuki, Sho; and Nakashima, Norihiko, 4,373,043, Cl. 524-130.000.
Suzuki, Yoshiharu; and Kai, Tomokazu, to Nippon Electric Co., Inc. Transmitter control system. 4,373,206, Cl. 455-103.000.
Svensson, Kent A.: *See*—
Bernhardsson, Ake A.; and Svensson, Kent A., 4,372,276, Cl. 123-525.000.
Svoboda, Josef; and Edinger, Franz K., to TMC Corporation. Safety ski binding. 4,372,574, Cl. 280-634.000.
Swalwell, John E.: *See*—
Gibson, David V.; McKay, Garry M.; and Swalwell, John E., 4,373,054, Cl. 524-460.000.
Swanson-Erie Corporation: *See*—
Notarione, Patrick D.; Turk, Ronald K.; and Grafius, Gerald, 4,372,463, Cl. 221-10.000.
Syberg, Jan, to Boeing Company, The. Supersonic inlet having variable area sideplate openings. 4,372,505, Cl. 244-53.00B.
Symes, Kenneth C.: *See*—
Lawson, Christopher J.; and Symes, Kenneth C., 4,372,785, Cl. 106-170.000.
Szatmari, Jozsef: *See*—
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, 4,372,172, Cl. 73-862.390.
Szereday, Pal, to Novex Foreign Trade Co. Ltd. for Development and Commercialization of Inventions. Device for removing floating liquid impurities, oil, from a flowing water surface. 4,372,854, Cl. 210-242.300.
Szoke, Karoly: *See*—
Gombocz, Karoly; Korbuly, Jozsef; Krampe, Geza; Szatmari, Jozsef; and Szoke, Karoly, 4,372,172, Cl. 73-862.390.
Szostak, Jan, to Singer Company, The. Tapered screw fastening means for bushings, sleeves and bearings. 4,372,703, Cl. 403-324.000.
Szydlowski, Donald F.: *See*—
Sederquist, Richard A.; Szydlowski, Donald F.; and Sawyer, Richard D., 4,372,759, Cl. 55-73.000.
Taff, James T., to Dimetrics, Inc. Full function in-place weld head. 4,372,474, Cl. 228-29.000.
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, to Ube Industries, Ltd. Process for preparing N-alkyl-alkylene-diamines. 4,373,107, Cl. 564-473.000.
Tai, King L.: *See*—
Reichmanis, Elsa; Roman, Bernard J.; Tai, King L.; and Wilkins, Cletus W., Jr., 4,373,018, Cl. 430-312.000.
Takacs, Kalman; Papp, Maria H.; Kovacs, Gabor; Ajzert, Ilona K.; Simay, Antal; Nagy, Peter L.; Puskas, Marian E.; Sebestyen, Gyula; Stadler, Istvan; and Sumeghy, Zoltan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara. Sulfur-containing isoquinoline derivatives, process for the preparation thereof and pharmaceutical compositions containing them. 4,373,104, Cl. 546-145.000.
Takahashi, Katsuhiro: *See*—
Arai, Tadashi; Takahashi, Katsuhiro; Ishiguro, Kimiko; and Yokoyama, Koji, 4,372,947, Cl. 424-121.000.
Takahashi, Kenichi: *See*—
Harigane, Kotaro; Takahashi, Kenichi; Shudo, Hirokazu; and Tando, Shuichi, 4,372,802, Cl. 156-538.000.
Takahashi, Masaaki; and Hamamura, Hideki. Method for regenerating an etch solution for aluminum and the alloys thereof. 4,372,805, Cl. 156-642.000.
Takano, Suwaji: *See*—
Tsuchiya, Toshio; Enokimoto, Akito; Mizushima, Sadao; and Takano, Suwaji, 4,372,602, Cl. 296-78.00R.
Takase, Sadao, to Nissan Motor Company, Limited. Digital control system for internal combustion engine. 4,372,274, Cl. 123-491.000.
Takashima, Koichi: *See*—
Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Tuneyoshi; Takashima, Koichi; and Kato, Yasuhiko, 4,372,846, Cl. 210-86.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,372,952, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,372,952, Cl. 424-246.000.
Takeda Chemical Industries, Ltd.: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,373,028, Cl. 435-253.000.
Kitamori, Nobuyuki; Hemmi, Keizi; and Maeno, Masaya, 4,372,968, Cl. 424-280.000.
Takemura, Yasuhiko; Okazaki, Takahisa; and Imai, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic diagnosing apparatus. 4,372,323, Cl. 128-660.000.
Takenaka, Toichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,373,106, Cl. 564-85.000.
Takeshima, Masaki: *See*—
Sugimoto, Yoshikazu; Shirosaki, Kiyotaka; Kawaguchi, Masashi; and Takeshima, Masaki, 4,372,859, Cl. 210-739.000.
Takeuchi, Tomio: *See*—
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,373,094, Cl. 536-6.400.
Takizawa, Junichi; Kojima, Seiichiro; Satoh, Nobuo; and Nakazato, Eiji, to Fuji Jukogyo Kabushiki Kaisha. Passive safety belt device. 4,372,578, Cl. 280-802.000.
Talres Development (N.A.) N.V.: *See*—
Lawson, Christopher J.; and Symes, Kenneth C., 4,372,785, Cl. 106-170.000.
Tamura, Shoichi; Asami, Takayoshi; and Sonoi, Hidekazu, to Kabushiki Kaisha Kobe Seiko Sho. Air liquefaction and separation process and equipment. 4,372,765, Cl. 62-29.000.
Tanaka, Miki: *See*—
Isogai, Hideaki; and Tanaka, Miki, 4,373,196, Cl. 365-189.000.
Tando, Shuichi: *See*—
Harigane, Kotaro; Takahashi, Kenichi; Shudo, Hirokazu; and Tando, Shuichi, 4,372,802, Cl. 156-538.000.
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Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, 4,373,026, Cl. 435-191.000.
Tanida, Seiichi: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,373,028, Cl. 435-253.000.
Tapco Products Company, Inc.: *See*—
Rhoades, James J., 4,372,142, Cl. 72-319.000.
Taplin, Lael B.: *See*—
Walter, Richard P.; and Taplin, Lael B., 4,372,272, Cl. 123-467.000.
Taragos, Peter. Upholstery cleaning pad and method of making the same. 4,372,867, Cl. 252-91.000.
Tarumi, Niro; Sugimura, Mitsuo; Komiya, Shigeo; and Tsuchiya, Makoto, to Hoya Lens Corporation. Terpolymer with a high refractive index. 4,373,076, Cl. 526-261.000.
Tasch, Al F., Jr., to Texas Instruments Incorporated. Very high density punch-through read-only-memory. 4,373,165, Cl. 357-13.000.
Taylor, David A.: *See*—
Dey, Philip; Gaylard, Bernard; and Taylor, David A., 4,372,792, Cl. 156-48.000.
TEC, Inc.: *See*—
Wyslotsky, Thor, 4,372,097, Cl. 53-405.000.
Tecl, Bohuslav: *See*—
Knoke, Jurgen; Jost, Manfred; Fahrbach, Erich; and Tecl, Bohuslav, 4,373,000, Cl. 428-198.000.
Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,372,301, Cl. 128-94.000.
Teeple, Michael: *See*—
Stroup, John F.; Robins, Harold J.; and Teeple, Michael, 4,372,910, Cl. 264-532.000.
Teletype Corporation: *See*—
Herbst, Wayne R., 4,373,114, Cl. 178-17.00D.
Huntoon, Francis E., 4,372,519, Cl. 248-466.000.
Tennyson, Bill E.: *See*—
Fette, Bruce A.; Harte, Bruce D.; and Tennyson, Bill E., 4,373,191, Cl. 364-724.000.
Terry, Clegia L. Tapered tooth helical gear drive train for eliminating the need for end thrust bearings. 4,372,176, Cl. 74-409.000.
Terry, F. Duncan: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,373,193, Cl. 364-900.000.
Tetra Pak Developpement SA: *See*—
Petersen-Hoj, Peter, 4,373,002, Cl. 428-213.000.
Tetra Pak International AB: *See*—
Dilot, Rolf M.; and Hakansson, Jan T., 4,372,797, Cl. 156-249.000.
Tetra Werke Dr. rer. nat. Ulrich Baensch Gesellschaft mit beschrankter Haftung: *See*—
Ritter, Gunter, 4,372,858, Cl. 210-674.000.
Texaco Inc.: *See*—
Nieh, Edward C. Y., 4,372,873, Cl. 252-389.00R.
Rooney, John F.; and Pindell, Robert G., 4,372,382, Cl. 166-264.000.
Speranza, George P.; Cuscurida, Michael; and Zimmerman, Robert L., 4,373,034, Cl. 521-177.000.
Virk, Kashmir S.; and Alperstein, Martin, 4,372,111, Cl. 60-274.000.
Texas Instruments Incorporated: *See*—
Lam, Hon W., 4,372,990, Cl. 427-53.100.
Tasch, Al F., Jr., 4,373,165, Cl. 357-13.000.
Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, 4,372,031, Cl. 29-571.000.
White, Arlton H., 4,372,420, Cl. 181-120.000.
Textilma AG: *See*—
Muller, Jakob, 4,372,133, Cl. 66-120.000.
Tezucar, Okan K.: *See*—
Holz, George E.; and Tezucar, Okan K., 4,373,157, Cl. 340-805.000.
Thakrar, Anil C.: *See*—
Schubert, Paul C.; and Thakrar, Anil C., 4,373,048, Cl. 524-371.000.
Theobald, Alan, to Air Products and Chemicals, Inc. Method of producing gaseous oxygen and a cryogenic plant in which said method can be performed. 4,372,764, Cl. 62-13.000.
Thermo King Corporation: *See*—
Waldschmidt, John E., 4,372,635, Cl. 339-45.00M.
Thettu, Raghulinga R.: *See*—
Malachowski, Michael A.; Shur, Victor; and Thettu, Raghulinga R., 4,372,668, Cl. 355-3.00R.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriellgesellschaft m.b.H. Method and mobile machine for removing surface irregularities from a rail head of a railroad track. 4,372,714, Cl. 409-293.000.

Thirmulachar, Mandayam J.: *See*—
Narasimhan, Mandayam J., Jr.; and Thirmulachar, Mandayam J., 4,372,753, Cl. 44-52.000.

Thomae, Irving H., to Dartmouth College, Trustees of. Electronic device to record temperatures and the time of occurrence. 4,372,692, Cl. 374-104.000.

Thomamueller, Dieter: *See*—
Brunsch, Klaus; Herkert, Claus-Michael; and Thomamueller, Dieter, 4,372,795, Cl. 156-155.000.

Thomas & Betts Corporation: *See*—
Basile, Rocco F.; Blum, Kenneth P.; and Cole, John M., 4,372,048, Cl. 30-124.000.

Thompson, Howard. Lipstick applicator device. 4,372,331, Cl. 132-88.700.

Thompson, Kenneth P., to Champion International Corporation. Method and apparatus for forming a plastic fluid container with an integral handle. 4,372,737, Cl. 425-393.000.

Thompson, Larry F.: *See*—
Barns, Robert L.; Chandross, Edwin A.; Flamm, Daniel L.; Manzione, Louis T.; and Thompson, Larry F., 4,372,834, Cl. 204-157.10R.

Thompson, Mortimer S. Blow molded container with handle. 4,372,454, Cl. 215-100.00A.

Thomsen, Svend E.: *See*—
Petersen, Hans C.; Kyster, Erik; Thomsen, Svend E.; and Flagstad, Carl O., 4,372,413, Cl. 180-152.000.

Thomson-Brandt: *See*—
Crepin, Roger, 4,372,215, Cl. 102-387.000.

Thornburg, Robert O.: *See*—
Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.

Thorp, Neil: *See*—
Dyett, Derek H.; and Thorp, Neil, 4,372,327, Cl. 131-95.000.

Tice, Larry E., to Colt Industries Operating Corp. Screw and floating drive nut assembly. 4,372,222, Cl. 108-137.000.

TII Industries Inc.: *See*—
McDonald, Gerald F., 4,373,120, Cl. 179-175.000.

Tilch, Willi: *See*—
Besecke, Siegmund; Fink, Herbert; Sutterlin, Norbert; Markert, Gerhard; Schroder, Gunter; and Tilch, Willi, 4,373,056, Cl. 524-547.000.

Till, Henry R.: *See*—
Fantuzzo, Joseph; and Till, Henry R., 4,372,669, Cl. 355-3.00R.

Tinning, Robert C. Building construction. 4,372,733, Cl. 425-60.000.

Tinsley, James M., to N-S-W Corporation. Compact power wrenching machine. 4,372,181, Cl. 81-57.390.

Tison, Eric; and Herve, Paul, to Codimag; and Ets. Destouche. Device for controlling the movement of a web through a printing machine. 4,372,206, Cl. 101-228.000.

Tissot, Alain; and Bourlier, Claude. Panel structure for public enclosures. 4,372,225, Cl. 109-19.000.

Tittmann, Bernhard R.; Ahlberg, Lloyd A.; and Elsley, Richard K., to Rockwell International Corporation. Acoustic measurement of near surface property gradients. 4,372,163, Cl. 73-602.000.

TMC Corporation: *See*—
Svoboda, Josef; and Edinger, Franz K., 4,372,574, Cl. 280-634.000.

Toda, Nobuhiro; and Yamada, Masahiko, to NGK Spark Plug Co., Ltd. Method of manufacturing oxygen sensor. 4,372,824, Cl. 204-25.000.

Todter, Folkhard: *See*—
Kausch, Erwin; and Todter, Folkhard, 4,372,328, Cl. 131-332.000.

Toelke, Lester W., to International Tool & Supply Co., Inc. Industrial pipe thread cleaner. 4,372,003, Cl. 15-88.000.

Toeppen, Thurston H.: *See*—
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., 4,372,634, Cl. 339-17.00C.

Toffolon, Roger L.: *See*—
Brown, William L.; and Toffolon, Roger L., 4,372,091, Cl. 52-593.000.

Tokumitsu, Naoki: *See*—
Asai, Yoshihiko; Hori, Masao; and Tokumitsu, Naoki, 4,373,128, Cl. 219-73.110.

Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Harigane, Kotaro; Takahashi, Kenichi; Shudo, Hirokazu; and Tando, Shuichi, 4,372,802, Cl. 156-538.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Matsuo, Katsuharu, 4,372,134, Cl. 68-12.00R.
Takemura, Yasuhiko; Okazaki, Takahisa; and Imai, Akira, 4,372,323, Cl. 128-660.000.
Yamada, Tetsuo, 4,373,167, Cl. 357-24.000.

Tolman, Radon; and Stephens, Frank M., Jr., to Enrecon, Inc. Production of a fuel gas with a stabilized metal carbide catalyst. 4,372,755, Cl. 48-197.00R.

Tomari, Yukio: *See*—
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,373,063, Cl. 525-64.000.

Tomioka, Soichiro; and Komiya, Yasuo, to Kabushiki Kaisha Saginomiya Seisakusho. Reversible expansion valve. 4,372,486, Cl. 236-92.00B.

Tomosada, Masahiro; Kimura, Yoshimasa; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,372,673, Cl. 355-14.00R.

Tomy Corporation: *See*—
Spring, Gordon W., 4,372,078, Cl. 46-150.000.

Tool Dynamics, Inc.: *See*—
Fink, Raymond W., 4,372,449, Cl. 211-86.000.

Toriyama, Kazuhisa; Nakagomi, Tamihito; Sato, Hisato; Fujita, Yutaka; Morita, Katsuhiko; and Arai, Yoshi, to Dainippon Ink and Chemicals, Inc.; and Hitachi Ltd. Nematic liquid crystals for display devices. 4,372,871, Cl. 252-299.610.

Tornberg, Claes: *See*—
Aslund, Christer; Eriksson, Hans; and Tornberg, Claes, 4,373,012, Cl. 428-558.000.

Toth-Sarudy, Eva: *See*—
Ambrus, Gabor; Toth-Sarudy, Eva; Cseh, Gyorgy; Barta, Istvan; and Horvath, Gyula, 4,372,973, Cl. 424-305.000.

Totino, Peter J.; and Davidson, Donald R., to Singer Company, The. Two dimensional feed for monogram sewing machine. 4,372,237, Cl. 112-308.000.

Totino, Peter J.: *See*—
Killinger, Karl H.; Johnson, Kenneth M.; and Totino, Peter J., 4,372,234, Cl. 112-258.000.

Toton, Edward T.; and Zimet, Elihu, to United States of America, Navy. Explosive auto-enhancement device. 4,372,214, Cl. 102-305.000.

Tower Systems Inc.: *See*—
Sanderson, William G.; Sumner, Richard B.; and Kragh, Loren G., 4,372,897, Cl. 261-153.000.

Toyama Chemical Co., Ltd.: *See*—
Kodama, Yutaka; Oyama, Kaoru; Shimizu, Ryusaku; Nakabayashi, Masao; Nakashima, Yoshifumi; Sano, Takashi; Shibata, Masaaki; and Goden, Kiyoshi, 4,372,949, Cl. 424-199.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,372,457, Cl. 215-228.000.

Toyoda, Hideaki, to Komori Printing Machinery Co., Ltd. Ink fountain devices for use in printing press. 4,372,207, Cl. 101-365.000.

Toyoda, Kazuhiro; Ono, Chikai; and Hayashi, Toshio, to Fujitsu Limited. Semiconductor integrated circuit device. 4,373,195, Cl. 365-154.000.

Toyoda, Ryuichi: *See*—
Kuramochi, Hiroshi; and Toyoda, Ryuichi, 4,372,740, Cl. 425-544.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Inukai, Mitsuo, 4,372,501, Cl. 242-107.000.
Motonami, Masanao; Ogawa, Hisashi; and Imai, Yoshikazu, 4,372,580, Cl. 280-802.000.

Trafcon, Inc.: *See*—
Morse, Randall L., 4,372,536, Cl. 256-64.000.

Trageser, Ann S. Garden edging structure. 4,372,079, Cl. 47-33.000.

Transportation Security Inc.: *See*—
Mickelson, Thorwald J., 4,372,136, Cl. 70-14.000.

Trevino, Joe, Jr., to Reed Rock Bit Company. Combination fluid nozzle and backflow valve. 4,372,402, Cl. 175-318.000.

Trevoy, Lloyd W.: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.

Tringali, Robert D., to Eisenberg, Joel H. Ski boot. 4,372,062, Cl. 36-120.000.

Trinkwalder, Joseph C., Jr., to Sherwood Selpac Corp. Pressure-retaining valve and method of retaining pressure. 4,372,343, Cl. 137-614.200.

Trio Kabushiki Kaisha: *See*—
Kaneda, Ryoichi, 4,373,209, Cl. 455-208.000.

Triplett, Baylor B.; Ferrando, Carlo; and Galli, Guido, to Intel Magnetics, Inc. Process for removing a liquid phase epitaxial layer from a wafer. 4,372,808, Cl. 156-655.000.

Tritt, William R. Rudder assembly. 4,372,241, Cl. 114-162.000.

Trucco, Horacio A. Internal combustion engine for diverse fuels. 4,372,264, Cl. 123-255.000.

Tsaur, Shyh-Chang; and Kuo, Chang-Kiang, to Texas Instruments Incorporated. Method of making high density memory cells with improved metal-to-silicon contacts. 4,372,031, Cl. 29-571.000.

Tsuchiya, Makoto: *See*—
Tarumi, Niro; Sugimura, Mitsuo; Komiya, Shigeo; and Tsuchiya, Makoto, 4,373,076, Cl. 526-261.000.

Tsuchiya, Osamu: *See*—
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Osoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.

Tsuchiya, Toshio; Enokimoto, Akito; Mizushima, Sadao; and Takano, Suwaji, to Honda Giken Kogyo Kabushiki Kaisha. Small-sized vehicle. 4,372,602, Cl. 296-78.00R.

Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,372,952, Cl. 424-246.000.

Tsuji, Tomohiro: *See*—
Komoto, Akira; and Tsuji, Tomohiro, 4,372,406, Cl. 177-212.000.

Tsunoda, Masakazu: *See*—
Shimizu, Michiro; and Tsunoda, Masakazu, 4,373,116, Cl. 179-1.0SM.

Tufteo Corporation: *See*—
Maier, H. Armin, 4,372,001, Cl. 8-151.000.

Turk, Ronald K.: *See*—
Notarione, Patrick D.; Turk, Ronald K.; and Grafius, Gerald, 4,372,463, Cl. 221-10.000.

Turner, Norris G.: *See*—
Mills, David A.; and Turner, Norris G., 4,373,185, Cl. 364-478.000.

Turner, Peter R.: *See—*
Dowding, John G.; Turner, Peter R.; and Hudson, Robert J., 4,373,188, Cl. 364-552.000.
Twin Disc, Incorporated: *See—*
Aschauer, George R., 4,372,434, Cl. 192-85.0AA.
Tyco Industries, Inc.: *See—*
Harkins, Samuel J., 4,372,075, Cl. 46-1.00K.
Tyler, Michael N.: *See—*
Hoelzen, Warren R.; Prescott, John F.; and Tyler, Michael N., 4,372,212, Cl. 102-264.000.
UBE Industries Ltd.: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.
Tahara, Susumu; Nishihira, Keigo; Miyatake, Takashi; Sawada, Hiroyuki; and Kita, Junichiro, 4,373,107, Cl. 564-473.000.
Uchida, Keiichi: *See—*
Oda, Yoshio; Otouma, Hiroshi; Uchida, Keiichi; Morikawa, Shinsuke; and Ikemura, Masaaki, 4,372,938, Cl. 423-469.000.
Uchida, Minoru; Nishi, Takao; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Company, Limited. Tetrazole derivatives, and anti-ulcer composition containing the same. 4,372,953, Cl. 424-248.500.
Uebelhart, Walter; Gilomen, Beat; and Parel, Claude, to A. Michael S.A. Rotary yarn guide for textile machines. 4,372,108, Cl. 57-358.000.
Ueda, Masahiro: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Hondo, Tadahiro; and Ueda, Masahiro, 4,373,087, Cl. 528-337.000.
Uekita, Masakazu: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
Ueno, Susumu: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,372,986, Cl. 427-40.000.
Uhlig, Curtis A. Insole, apparatus for molding and method of making shoes. 4,372,525, Cl. 249-102.000.
Uhrhane, Francis J.: *See—*
Sartori, Eugene F.; and Uhrhane, Francis J., 4,373,121, Cl. 179-175.30F.
Ulrich, Reinhard, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method and arrangement for the measurement of rotations. 4,372,685, Cl. 356-350.000.
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Hanabusa, Takayoshi; Yamamoto, Kenji; Umemoto, Shinzi; Kurosawa, Keiji; and Yamashita, Mitsuo, 4,372,804, Cl. 156-631.000.
Umezawa, Hamao: *See—*
Oki, Toshikazu; Matsuzawa, Yasue; Ishikura, Tomoyuki; Takeuchi, Tomio; and Umezawa, Hamao, 4,373,094, Cl. 536-6.400.
Unger, Hans-Georg, to Licentia Patent-Verwaltungs-GmbH. Strip diode laser with reactance free fiber output. 4,372,644, Cl. 350-96.200.
Unger, Klaus: *See—*
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, 4,372,878, Cl. 252-455.00Z.
Uni-Flange Corporation: *See—*
Roche, Charles W., 4,372,587, Cl. 285-238.000.
Union Carbide Corporation: *See—*
Bobst, Robert W.; Garner, Billy J.; and Jacob, Frederick W., 4,372,758, Cl. 55-48.000.
Matthews, William G.; Sicard, Jean-Paul; and Anderson, Richard A., 4,372,857, Cl. 210-673.000.
Potts, James E., 4,372,311, Cl. 128-287.000.
Union Oil Company of California: *See—*
Backlund, Peter S., 4,372,872, Cl. 252-313.00R.
Hass, Robert H., 4,372,932, Cl. 423-351.000.
Union Special G.m.b.H.: *See—*
Ciecior, Heinrich K., 4,372,230, Cl. 112-139.000.
Pearey, John T., 4,372,618, Cl. 299-31.000.
United Kingdom Atomic Energy Authority: *See—*
Denton, Ivor E.; and Henney, John W., 4,372,902, Cl. 264-65.000.
United States Filter Corporation: *See—*
Reinauer, Thomas V., 4,372,821, Cl. 202-263.000.
United States Gypsum Company: *See—*
Johnstone, Norman E.; and Kehoe, John R., 4,372,814, Cl. 162-124.000.
U.S. Manufacturing Co.: *See—*
Lerman, Max, 4,372,298, Cl. 128-80.00C.
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Army: *See—*
Dante, James G., 4,372,211, Cl. 102-207.000.
Kirkendall, Richard D.; Drysdale, William H.; Kokinakis, Louise D.; and Burns, Bruce P., 4,372,217, Cl. 102-521.000.
Lienau, Jeffrey A., 4,372,192, Cl. 89-1.800.
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Mayfield, Glenn L., 4,372,853, Cl. 210-232.000.
Nelson, Paul A.; and Horowitz, Jeffrey S., 4,372,376, Cl. 165-104.120.
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Hjelmeland, Leonard M., 4,372,888, Cl. 260-397.100.
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Cheng, Dah Y. Noise suppressor for turbo fan jet engines. 4,372,110, Cl. 60-262.000.
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Adams, Richard R.; MacConochie, Ian O.; and Poole, Bordie D., Jr., 4,372,680, Cl. 356-51.000.
Doggett, Robert V., Jr.; and Ricketts, Rodney H., 4,372,158, Cl. 73-147.000.
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Morris, James F., 4,372,377, Cl. 165-104.260.
Morris, James F., 4,373,142, Cl. 310-306.000.
Mueller, William A.; Ingham, John D.; and Reilly, William W., 4,373,039, Cl. 523-205.000.
Schomburg, Calvin; and Dotts, Robert L., 4,373,003, Cl. 428-241.000.
Navy: *See—*
Collins, David A.; and Lile, Derek L., 4,372,032, Cl. 29-571.000.
Frisch, Georg D.; and Ward, William, Jr., 4,372,508, Cl. 244-122.0AG.
Gigante, Joseph R., 4,372,803, Cl. 156-626.000.
Gutz, Kenneth H., 4,373,148, Cl. 318-254.000.
Hanson, Paul A.; Hightower, John D.; and Strickland, Alvah T., 4,372,359, Cl. 114-244.000.
Hoelzen, Warren R.; Prescott, John F.; and Tyler, Michael N., 4,372,212, Cl. 102-264.000.
Lewis, Bernard L.; and Kretschmer, Frank F., 4,373,190, Cl. 364-715.000.
Lindberg, Jan F., 4,373,143, Cl. 310-334.000.
Rozner, Alexander G.; and Helms, Horace H., 4,372,213, Cl. 102-301.000.
Singer, Arnold H.; and Holm, Ronald T., 4,372,642, Cl. 350-96.120.
Toton, Edward T.; and Zimet, Elihu, 4,372,214, Cl. 102-305.000.
U.S. Peroxygen Company: *See—*
Peterson, David, 4,372,877, Cl. 260-453.0RZ.
U.S. Philips Corporation: *See—*
Gustin, Pol A. G. J.; and Schayes, Raymond G. G., 4,372,045, Cl. 29-846.000.
Krainhofer, Gunter, 4,372,509, Cl. 248-27.100.
United Technologies Corporation: *See—*
Galasso, Francis S.; and Veltri, Richard D., 4,373,006, Cl. 428-368.000.
Landsman, Douglas A.; and Luczak, Francis J., 4,373,014, Cl. 429-13.000.
Sederquist, Richard A.; Szydlowski, Donald F.; and Sawyer, Richard D., 4,372,759, Cl. 55-73.000.
Universal Data Systems, Inc.: *See—*
Pierce, O. Leon, 4,373,117, Cl. 179-2.0DP.
University of Georgia Research Foundation, Inc.: *See—*
King, Allen D., Jr.; King, Robert B.; and Sailers, Earl L., III, 4,372,833, Cl. 204-157.10R.
University of Pittsburgh: *See—*
Gilbertson, John R.; and Crout, Richard J., 4,372,978, Cl. 424-343.000.
UOP Inc.: *See—*
Kulprathipanja, Santi; and Neuzil, Richard W., 4,372,876, Cl. 252-430.000.
Neuzil, Richard W.; and Priegnitz, James W., 4,373,025, Cl. 435-94.000.
Olson, Larry D., 4,372,347, Cl. 139-420.00C.
Uozumi, Shoji: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,372,800, Cl. 156-307.300.
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USM Corporation: *See—*
Gooch, Kendrick J.; Scharer, Hans R.; and Winter, William, 4,372,736, Cl. 425-149.000.
Usui, Mitsuko: *See—*
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, 4,372,883, Cl. 260-112.00R.
Utsunomiya, Yoichi: *See—*
Miyata, Shin; Kono, Tateomi; Shibazaki, Kenji; and Utsunomiya, Yoichi, 4,372,676, Cl. 355-14.00C.
Vale, Wylie W., Jr.: *See—*
Brown, Marvin R.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,372,884, Cl. 260-112.50S.
Valentine, John J.; and Fera, Julius J. Wrap ring assembly for precision no-draft forging. 4,372,144, Cl. 72-352.000.
VALEO: *See—*
Rogier, Leonce, 4,372,427, Cl. 188-72.100.
Vallaude, Jean P. Internal combustion engine piston. 4,372,194, Cl. 92-176.000.
Van Dorn Company: *See—*
Stroup, John F.; Robins, Harold J.; and Teeple, Michael, 4,372,910, Cl. 264-532.000.
Vandebult, Jan, to I.D. Engineering, Inc. Loop antenna for security systems. 4,373,163, Cl. 343-842.000.
Van Der Linden, Roy E. Wood-burning stove and method for burning wood. 4,372,287, Cl. 126-79.000.
Van Horn, Ronald L. Hay bale trailer. 4,372,722, Cl. 414-44.000.
Van Mullekom, Hubert P., to Ruti-Te Strake B.V. Method for weaving with a shuttleless weaving machine, and weft preparation device to be used therein. 4,372,349, Cl. 139-452.000.

Van Mullekom, Hubert P., to Ruti-Te Strake B.V. Device for forming store units from a thread supplied from a yarn packet. 4,372,498, Cl. 242-47.010.
Van Rijckevorsel, Rainer: *See*—
Nenninger, Klaus; and Van Rijckevorsel, Rainer, 4,372,682, Cl. 356-244.000.
Vansteelant, Marc G., to Sperry Corporation. Knotter billhook. 4,372,588, Cl. 289-8.000.
Vansteelant, Marc G., to Sperry Corporation. Knotter apparatus. 4,372,589, Cl. 289-13.000.
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De Coene, Frans J. G. C.; Naaktgeboren, Adrianus; and Vansteelant, Marc G., 4,372,723, Cl. 414-111.000.
Van Thyne, Ray J.: *See*—
Rausch, John J.; and Van Thyne, Ray J., 4,372,995, Cl. 427-300.000.
Van Uitert, LeGrand G.: *See*—
Johnson, Leo F.; and Van Uitert, LeGrand G., 4,372,641, Cl. 350-96.120.
Van Zanten, Marinus: *See*—
Davies, David R.; Richardson, Edwin A.; and Van Zanten, Marinus, 4,372,385, Cl. 166-281.000.
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Vartanian, Haig. External/internal heater for molding of plastics. 4,373,132, Cl. 219-421.000.
Vassiliades, Anthony E. Chromogenic copy system and method. 4,372,583, Cl. 282-27.500.
Veb Kombinat Polygraph "Werner Lamberz": *See*—
Jentzsch, Arndt; Johne, Hans; Hefftler, Victor; Kuhnert, Werner; and Karl, Reiner, 4,372,209, Cl. 101-409.000.
VEB Kombinat Textima: *See*—
Aurich, Horst; Bochmann, Brigitta; Grosse, Klaus; Kohler, Eberhard; Nestler, Michael; Ochsenfarth, Hans-Christian; and Seyfarth, Gerhard, 4,372,548, Cl. 271-18.300.
Veda, Inc.: *See*—
Buschbom, Floyd E.; Henke, Donald L.; and Hansen, Glen D., 4,372,729, Cl. 414-700.000.
Veltri, Richard D.: *See*—
Galasso, Francis S.; and Veltri, Richard D., 4,373,006, Cl. 428-368.000.
Verdicchio, Robert J.: *See*—
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., 4,372,869, Cl. 252-174.160.
Vermillion, Don W., to Singer Company, The. Wide-sweep carpet cleaner bristle strip and brush roll. 4,372,004, Cl. 15-182.000.
Versatile Cornat Corporation: *See*—
Crawley, Harry D., 4,372,341, Cl. 137-580.000.
Verschage, Richard, to Advance Metalworking Co., The. Lift bed tandem axle trailer. 4,372,572, Cl. 280-423.00B.
Vetter, Heinz; and Friederich, Ernst, to Rom GmbH. Extrusion nozzle. 4,372,739, Cl. 425-466.000.
Vicino, Robert K. Fabric faced billboard. 4,372,071, Cl. 40-624.000.
Victor United, Inc.: *See*—
Simonds, Gary; and McKee, Arnold D., 4,372,285, Cl. 124-90.000.
Victoreen, Inc.: *See*—
Yurdin, Carl, 4,372,551, Cl. 972-73.000.
Vidrierias de Llodio, S.A.: *See*—
Galindez, Luis, 4,372,471, Cl. 225-1.000.
Vielhaber, Robert G.: *See*—
Olson, Alan J.; and Vielhaber, Robert G., 4,373,093, Cl. 528-491.000.
Viesturs, Eric; and Viesturs, Gundar. Thermal treatment device. 4,372,318, Cl. 128-403.000.
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Vijil-Rosales, Cesar A. Apparatus and method for surgical correction of ptotic breasts. 4,372,293, Cl. 128-1.00R.
Villa, Paul Y.; and Day, Alvin D., to Sperry Corporation. Slide interlock and cabinet stabilizer. 4,372,632, Cl. 312-311.000.
Villari, Frank K.; and Cianci, James P., to Kendall Company, The. Body drainage receptacle with anti-septic catheter contact surface in receiving pocket. 4,372,313, Cl. 128-295.000.
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Chang, Tiang-Shing; Zientek, Lucy J.; Viningauz, Arthur; and Scheps, Marcy L., 4,373,036, Cl. 523-120.000.
Virk, Kashmir S.; and Alperstein, Martin, to Texaco Inc. Method for cyclic rejuvenation of an exhaust gas filter and apparatus. 4,372,111, Cl. 60-274.000.
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Dolenc, Anton; and Visek, Tomas, 4,372,179, Cl. 74-579.00E.
Visos, Charles D.; and Ferguson, James M., to Emerson Electric Co. Gas burner head with means for evacuating trapped water condensate. 4,372,290, Cl. 126-355.000.
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Vitto, Renato: *See*—
Bellicardi, Francesco; and Vitto, Renato, 4,372,896, Cl. 261-121.00B.
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Sokolov, Sergei S.; Komovsky, Vadim R.; Vlasov, Leonid I.; Boretsky, Boris M.; and Shiryaev, Grigory V., 4,372,121, Cl. 60-606.000.
Vlsi Technology Research Association: *See*—
Saitoh, Shinji, 4,372,030, Cl. 29-569.00R.
Vodicka, Vincent: *See*—
Bradley, Irving; and Vodicka, Vincent, 4,372,794, Cl. 156-73.100.
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Hofbauer, Peter; Gaschler, Erich; and Schwarz, Cornelia, 4,372,257, Cl. 123-68.000.
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Seipp, Ulrich; Vollenberg, Werner; Mueller, Bernd; and Michel, Gudrun, 4,372,971, Cl. 424-285.000.
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Morgan, Steven R.; and Carlson, Linda A., 4,372,561, Cl. 273-411.000.
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Hughes, Nathaniel, 4 372,169, Cl. 73-861.520.
Vorys, Nichols. Vaginal delivery for physiologic follicular-luteal steroid treatment. 4,372,951, Cl. 424-239.000.
Vosper, George. Internal combustion engine. 4,372,259, Cl. 123-79.00R.
Vossen, John L., Jr., to RCA Corporation. Plasma etching technique. 4,372,806, Cl. 156-643.000.
Vossen, John L., Jr.; and Halon, Bernard, to RCA Corporation. Plasma etching of aluminum. 4,372,807, Cl. 156-643.000.
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Frame, Norman J., 4,373,122, Cl. 200-159.00B.
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W-K-M Wellhead Systems, Inc.: *See*—
Diehl, Robert J.; Godare, William L.; and Wells, Frederic D., 4,372,563, Cl. 277-117.000.
Wadsworth, Donald H.: *See*—
Fletcher, George L.; and Wadsworth, Donald H., 4,373,021, Cl. 430-374.000.
Waine, Martin; and Nisenson, Jules, to General Clutch Corp. Bi-directional clutch. 4,372,432, Cl. 192-8.00C.
Waite, Warren A., to Ionics, Incorporated. Synthesis of anion exchange polymers employing diertiary amines. 4,373,031, Cl. 521-32.000.
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Wakim, Edmond K. Device for indicating direction to a predetermined locale. 4,372,052, Cl. 33-349.000.
Waldschmidt, John E., to Thermo King Corporation. Multiple connector plug removal device. 4,372,635, Cl. 339-45.00M.
Wall, W. Henry. Dental sponge. 4,372,314, Cl. 128-296.000.
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Ganner, Peter; and Wallner, Theodor, 4,372,987, Cl. 427-42.000.
Walter, Richard P.; and Taplin, Lael B., to Bendix Corporation, The. Fuel delivery system with feed and drain line damping. 4,372,272, Cl. 123-467.000.
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Laakmann, Katherine D.; and Laakmann, Peter, 4,373,202, Cl. 372-64.000.
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Frisch, Georg D.; and Ward, William, Jr., 4,372,508, Cl. 244-122.0AG.
Warner-Lambert Company: *See*—
Butler, Donald E., 4,372,966, Cl. 424-274.000.
L'Italien, Yvon J., 4,372,960, Cl. 424-267.000.
Warner, Lucien: *See*—
Mathews, Lester R., 4,371,994, Cl. 4-490.000.
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Yasui, Toshihiro; and Warnke, Wayne L., 4,372,567, Cl. 280-21.00R.
Washabaugh, Frank J., to Engelhard Corporation. Asbestos-free friction material incorporating attapulgite clay. 4,373,037, Cl. 523-155.000.
Watanabe, Katsumi, to Ozen Corporation. Apparatus for electromagnetically imparting stylus force for sound reproducing device comprising an inhibit circuit for shock noise of reproducing stylus. 4,373,199, Cl. 369-31.000.
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Watanabe, Takeshi, to Nissan Motor Company, Limited. Fixing structure. 4,372,701, Cl. 403-24.000.
Watanabe, Yutaka; and Matsuo, Hisayasu, to Fujitsu Limited. Thick film fine pattern forming method. 4,373,019, Cl. 430-317.000.
Water Circulation Patents, Inc.: *See*—
Mathews, Lester R., 4,371,994, Cl. 4-490.000.

Watson, Christopher A., to International Telephone and Telegraph Corporation. Flowmeter. 4,372,168, Cl. 73-861.280.
Watson, Colin; and Dunn, David J., to Loctite Corporation. Device for coating internal threads of a fastener. 4,372,245, Cl. 118-56.000.
Watson, Frederick D.; Mayse, Weldon D.; and Franse, Albert D., to Petrolite Corporation. Radial flow electrofilter. 4,372,837, Cl. 204-186.000.
Waugh, Charles C.; and Wehrli, Robert L., to Waugh Controls Corporation. Flow meter prover apparatus and method. 4,372,147, Cl. 73-3.000.
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Weant, Charles M. Signal conversion device. 4,373,189, Cl. 364-602.000.
Wear-Ever Aluminum, Inc.: *See*—
Brown, Leo F.; and Myerly, R. S., 4,372,199, Cl. 99-341.000.
Weas, Tom, to Dover Corporation. Arrangements for sensing the presence of liquid in a vapor line. 4,372,353, Cl. 141-206.000.
Weber, Eugen: *See*—
Hale, John M.; and Weber, Eugen, 4,372,021, Cl. 29-235.000.
Weber, Harold J., to Coulter Systems Corp. Image illumination compensation method and apparatus. 4,372,679, Cl. 355-70.000.
Weber S.p.A.: *See*—
Bellicardi, Francesco; and Vitto, Renato, 4,372,896, Cl. 261-121.00B.
Webster Spring Co. Inc.: *See*—
Ramsey, Henry R., 4,372,546, Cl. 267-100.000.
Wehrli, Robert L.: *See*—
Waugh, Charles C.; and Wehrli, Robert L., 4,372,147, Cl. 73-3.000.
Weidner, Albert J.: *See*—
Schultz, Gary E.; and Weidner, Albert J., 4,373,182, Cl. 364-200.000.
Weil, Edward D.: *See*—
Jung, Alfred K.; Silberberg, Joseph; and Weil, Edward D., 4,373,103, Cl. 544-195.000.
Welch, Joseph J.; Grove, William C.; and Moran, Michael E., to Lockheed Corporation. Slot-type accessory mounting. 4,372,517, Cl. 248-267.000.
Well-Pack Systems, Inc.: *See*—
Hamrick, Joseph T.; and Rose, Leslie C., 4,372,389, Cl. 166-369.000.
Wells, Frederic D.: *See*—
Diehl, Robert J.; Godare, William L.; and Wells, Frederic D., 4,372,563, Cl. 277-117.000.
Wells, Kirk P.: *See*—
Gibson, David W.; Hale, Albert L.; Pope, Daniel L.; Rutledge, Donald R.; and Wells, Kirk P., 4,372,535, Cl. 254-319.000.
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Le Caire, Robert A., Jr.; and Wendt, David W., 4,372,490, Cl. 239-59.000.
Wentworth, Roland A. L. Arithmetical teaching aid. 4,372,742, Cl. 434-199.000.
Wert, John C., III. Polarizing beam splitting phase transition optical modulator. 4,372,653, Cl. 350-385.000.
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Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,372,657, Cl. 354-53.000.
Western Electric Company, Inc.: *See*—
Chisholm, William M., 4,372,044, Cl. 29-845.000.
Coucoulas, Alexander; and Nis, John R., 4,372,771, Cl. 65-75.000.
Ellis, Benjamin C., Jr., 4,372,105, Cl. 57-204.000.
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Kiestra, Philippus P.; and Icking, Christian, 4,372,249, Cl. 119-14.170.
Westinghouse Electric Corp.: *See*—
Cookson, Alan H., 4,372,043, Cl. 29-828.000.
Westlund, Erik A., to Wolter Konstruktion Erik Axel Westlund. Method and system for continuous turn-over of soil. 4,372,396, Cl. 172-1.000.
Westphal, John C.: *See*—
Elert, Karl; and Westphal, John C., 4,372,143, Cl. 72-343.000.
Weyerhaeuser Company: *See*—
Wytko, Richard, 4,372,477, Cl. 229-39.00R.
Whelchel, Robert C.: *See*—
Sanderson, Roger S.; and Whelchel, Robert C., 4,372,921, Cl. 422-300.000.
White, Arlton H., to Texas Instruments Incorporated. Seismic exploration system. 4,372,420, Cl. 181-120.000.
White, Charles R.: *See*—
Stillman, Gordon B.; and White, Charles R., 4,372,597, Cl. 294-67.0DA.
White Consolidated Industries, Inc.: *See*—
Pontefract, Robert A., 4,372,652, Cl. 350-319.000.
White, Herbert V., to J. M. Huber Corporation. Folding pallet. 4,372,221, Cl. 108-51.300.
Whiteford, Carl. Multi-purpose turning tool. 4,372,361, Cl. 145-61.00R.
Whitney, Joel G., to Du Pont de Nemours, E. I., and Company. Antiinflammatory 4,5-diaryl-1H-imidazole-2-methanols. 4,372,964, Cl. 424-273.00R.
Whittam, Thomas V.: *See*—
Short, Glyn D.; and Whittam, Thomas V., 4,372,930, Cl. 423-326.000.
Whitten, Charles M.; Scott, Robert H.; and Mansfield, Vaughn, to Mansfield Carbon Products, Inc. Two-stage coal gasification process. 4,372,756, Cl. 48-202.000.
Wichman, Cynthia A., to Kendall Company, The. Disposable garment. 4,371,986, Cl. 2-051.000.
Wickham, Thomas J., to Magnetic Peripherals Inc. Tool for press-fitting a plurality of connector terminals. 4,372,040, Cl. 29-741.000.
Wico Corporation: *See*—
Kim, Syng N., 4,373,123, Cl. 200-159.00A.
Wiemann, Dieter; Seeger, Gunter; and Greten, Berndt, to Bison-Werke Bahre & Greten GmbH & Co. KG. Method of manufacturing particleboard and the like. 4,372,899, Cl. 264-25.000.
Wiener, Dieter; Sulzer, Gerd; Skyba, Rudolf, deceased (by Skyba, Dorothea, legal representative); and Pomp, Jurgen, to Liebherr-Verzahntechnik GmbH. Apparatus for form-grinding the tooth-flanks of a cylindrical gearwheel. 4,372,085, Cl. 51-216.0ND.
Wiers, John W.; Roper, Daniel W.; and Johnson, Richard F., to Rockwell International Corporation. Infinitely variable seat recliner mechanism. 4,372,612, Cl. 297-374.000.
Wilhoit, Darrel L.: *See*—
Newkirk, David D.; and Wilhoit, Darrel L., 4,372,815, Cl. 162-158.000.
Wilkins, Cletus W., Jr.: *See*—
Reichmanis, Elsa; Roman, Bernard J.; Tai, King L.; and Wilkins, Cletus W., Jr., 4,373,018, Cl. 430-312.000.
Williamson, Roger J.: *See*—
Pitt, Gillies D.; and Williamson, Roger J., 4,372,165, Cl. 73-861.220.
Willits, Samuel P.: *See*—
Mohan, William L.; Willits, Samuel P.; and Kleeman, Thomas E., 4,373,135, Cl. 377-8.000.
Wilputte Corporation: *See*—
Naevestad, Roy, 4,372,820, Cl. 202-248.000.
Wilson, Robert C., Jr.: *See*—
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,372,839, Cl. 208-59.000.
Windmoller & Holscher: *See*—
Achelpohl, Fritz; and Feldkamper, Richard, 4,372,436, Cl. 198-377.000.
Winkelman, John H., to Artos Engineering Company. Wire conveying clamp and apparatus for assembly of accurately sized wire ends to a terminal. 4,372,041, Cl. 29-747.000.
Winkler, Jerzy; and Stankiewicz, Jerzy, to Instytut Elektrotechniki Oddzial Technologii i Materialoznawstwa Elektrotechnicznego. High-voltage polymeric insulator with sheath of elastic and rigid segments and method of making same. 4,373,113, Cl. 174-179.000.
Winn, R. Alastair, to International Silicone Corporation. Method of forming a hydrophilic coating on a substrate. 4,373,009, Cl. 428-424.200.
Winslow, John M., to Minnesota Mining and Manufacturing Company. Decolorizable imaging system. 4,373,020, Cl. 430-339.000.
Winter, William: *See*—
Gooch, Kendrick J.; Scharer, Hans R.; and Winter, William, 4,372,736, Cl. 425-149.000.
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Saran, Herbert; Witthaus, Martin; Smulders, Eduard; and Schwadtke, Karl, 4,372,868, Cl. 252-102.000.
Wojno, Jan: *See*—
Cymbalisty, Lubomyr M.; Maskwa, Alvin J.; Trevoy, Lloyd W.; and Wojno, Jan, 4,372,174, Cl. 73-863.110.
Wojtech, Bernhard; Kiessling, Hans-Joachim; Becker, Wilhelm; and Hermann, Kurt, to Hoechst Aktiengesellschaft. Process for the preparation of glycidyl ethers of monohydric or polyhydric phenols, the glycidyl ethers and use thereof. 4,373,073, Cl. 525-507.000.
Wolf, Jakob; and Juhas, Simon, to J. M. Voith GmbH. Head box for a paper making machine. 4,372,816, Cl. 162-343.000.
Wolfe, W. Roger. Bag supporting apparatus. 4,372,512, Cl. 248-97.000.
Wolter Konstruktion Erik Axel Westlund: *See*—
Westlund, Erik A., 4,372,396, Cl. 172-1.000.
Wong, Yuan N.: *See*—
Mandle, Richard M.; and Wong, Yuan N., 4,372,745, Cl. 436-537.000.
Woo Seop, Choi. Cigarette package which has device to open and close. 4,372,443, Cl. 206-264.000.
Wood, Douglas E. Parabolic reflector comprising a plurality of triangular reflecting members forming a reflecting surface supported by a framework having a particular geometric pattern. 4,372,772, Cl. 65-106.000.
Wood, Jerold D.; and Stacy, Carl J., to Phillips Petroleum Company. Rubber compositions containing silica and tackifier resins. 4,373,041, Cl. 524-77.000.
Woods, Dale G.: *See*—
Woods, Verle W.; Woods, Jay A.; and Woods, Dale G., 4,372,918, Cl. 422-129.000.
Woods, Jay A.: *See*—
Woods, Verle W.; Woods, Jay A.; and Woods, Dale G., 4,372,918, Cl. 422-129.000.
Woods, Kenneth D. Air flow delivery system. 4,372,550, Cl. 271-211.000.
Woods, Verle W.; Woods, Jay A.; and Woods, Dale G. Flow through pressure reaction apparatus. 4,372,918, Cl. 422-129.000.
Woodward, David R.: *See*—
Hadler, Malcolm R.; Woodward, David R.; and Godfrey, Andrew A., 4,372,970, Cl. 424-282.000.
Woodward, Mervin: *See*—
Lane, David; Woodward, Mervin; and Kilpatrick, Jerry B., 4,372,637, Cl. 339-244.00R.
Woratyla, John A.: *See*—
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., 4,372,634, Cl. 339-17.00C.
Work, Casey N. Brush clearing apparatus for a bulldozer blade. 4,372,063, Cl. 37-2.00R.

Wright, Herschel E., to Beckman Instruments, Inc. Fluid containment annulus for fixed angle rotors. 4,372,483, Cl. 494-16.000.

Wright, Lawrence H.: *See—*
Clyne, Nicholas; Sturgeon, Philip L.; and Wright, Lawrence H., 4,373,133, Cl. 235-383.000.

Wu, Yao H.; and Lobeck, Walter G., Jr., to Mead Johnson & Company. Iminopyrrolidinylindoles. 4,372,887, Cl. 548-468.000.

Wuelfing, Johann A.: *See—*
Jozic, Ljerka, 4,372,955, Cl. 424-250.000.

Wuerzer, Bruno: *See—*
Rohr, Wolfgang; Schirmer, Ulrich; and Wuerzer, Bruno, 4,373,105, Cl. 560-27.000.

Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; Schmidt, Hans-Joachim; and Unger, Klaus, to Hoechst Aktiengesellschaft. Process for the preparation of an aluminum silicate catalyst for converting methanol containing water and/or dimethyl ether containing water into lower olefins. 4,372,878, Cl. 252-455.00Z.

Wurst, John W.: *See—*
Odermann, Charles R.; and Wurst, John W., 4,372,231, Cl. 112-158.00B.

Wyslotsky, Thor, to TEC, Inc. Method of making and filling a package for sliced commestible. 4,372,097, Cl. 53-405.000.

Wytko, Richard, to Weyerhaeuser Company. Container. 4,372,477, Cl. 229-39.00R.

Xerox Corporation: *See—*
Azar, Jack C.; Henry, Arnold W.; and Ferguson, Robert M., 4,372,246, Cl. 118-60.000.
Carpenter, Vance J.; and Smith, Abbott, 4,372,670, Cl. 355-8.000.
Fantuzzo, Joseph; and Till, Henry R., 4,372,669, Cl. 355-3.00R.
Malachowski, Michael A.; Shur, Victor; and Thettu, Raghulinga R., 4,372,668, Cl. 355-3.00R.
Noonan, D. Thomas, 4,372,515, Cl. 248-178.000.
Prest, William M., Jr., 4,373,065, Cl. 525-132.000.
Sahay, Ravi B., 4,372,675, Cl. 355-14.0FU.

Yagi, Kazuhisa; Suzuki, Sho; and Nakashima, Norihiko, to Kao Soap Co., Ltd. Color deepening agent. 4,373,043, Cl. 524-130.000.

Yamada, Hideaki; Tani, Yoshiki; and Isobe, Kimiyasu, to Amano Pharmaceutical Co., Ltd. Microbial polyamide oxidase PC-3 and process for preparation thereof. 4,373,026, Cl. 435-191.000.

Yamada, Masahiko: *See—*
Toda, Nobuhiro; and Yamada, Masahiko, 4,372,824, Cl. 204-25.000.

Yamada, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state image sensor with overflow protection and high resolution. 4,373,167, Cl. 357-24.000.

Yamagami, Seiji; Nonaka, Hirohiko; Shimonaru, Tuneyoshi; Takashima, Koichi; and Kato, Yasuhiko, to Daicel Chemical Industries Ltd. Blood purification system. 4,372,846, Cl. 210-86.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Igarashi, Nihaku, 4,372,416, Cl. 180-215.000.
Iwai, Tomio, 4,372,258, Cl. 123-73.0AD.
Yasui, Toshihiro; and Warnke, Wayne L., 4,372,567, Cl. 280-21.00R.

Yamamoto, Akio: *See—*
Matuhashi, Tyoku; Usui, Mitsuko; Yamamoto, Akio; Mitsuhashi, Masakazu; and Koyama, Shunsaku, 4,372,883, Cl. 260-112.00R.

Yamamoto, Hitoshi; Watanabe, Masaki; and Shido, Nobuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Drive unit mounting structure. 4,372,417, Cl. 180-215.000.

Yamamoto, Kenji: *See—*
Hanabusa, Takayoshi; Yamamoto, Kenji; Umemoto, Shinzi; Kurosawa, Keiji; and Yamashita, Mitsuo, 4,372,804, Cl. 156-631.000.

Yamamoto, Ryozo; Yanase, Keiichi; and Oku, Junzo, to Kubota, Ltd. Valve. 4,372,532, Cl. 251-175.000.

Yamana, Toru, to Murakami Kaimeido Co., Ltd. Rear-view mirror control actuator. 4,372,177, Cl. 74-501.00M.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,373,106, Cl. 564-85.000.

Yamaoka, Tetsuo: *See—*
Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,372,657, Cl. 354-53.000.

Yamashita, Atsuko: *See—*
Sugiyama, Takeshi; Shirouchi, Shoji; Tsuchiya, Osamu; Onoda, Mamoru; Yamashita, Atsuko; Fujita, Isao; and Imanishi, Nobuyuki, 4,372,779, Cl. 75-0.50R.

Yamashita, Kiyoshi: *See—*
Masukawa, Toyoaki; Ishikawa, Wataru; Okaniwa, Kenichiro; and Yamashita, Kiyoshi, 4,373,017, Cl. 430-270.000.

Yamashita, Mitsuo: *See—*
Hanabusa, Takayoshi; Yamamoto, Kenji; Umemoto, Shinzi; Kurosawa, Keiji; and Yamashita, Mitsuo, 4,372,804, Cl. 156-631.000.

Yanagawa, Nobuyuki; and Mizuma, Kenichi, to Ricoh Company, Ltd. Sheet feed apparatus. 4,372,547, Cl. 271-10.000.

Yanagiuchi, Shigenobu; and Kanou, Ikuo, to Sharp Kabushiki Kaisha. Display device of an electronic language interpreter. 4,373,192, Cl. 364-900.000.

Yanase, Keiichi: *See—*
Yamamoto, Ryozo; Yanase, Keiichi; and Oku, Junzo, 4,372,532, Cl. 251-175.000.

Yasui, Toshihiro; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaisha. Anti-rolling system for snowmobile of small size. 4,372,567, Cl. 280-21.00R.

Yin, Robert L., to Merck & Co., Inc. Blends of algin, tamarind, and a polycationic electroconductive polymer. 4,373,011, Cl. 428-537.000.

Yokoyama, Koji: *See—*
Arai, Tadashi; Takahashi, Katsuhiro; Ishiguro, Kimiko; and Yokoyama, Koji, 4,372,947, Cl. 424-121.000.

York-Shipley, Inc.: *See—*
Korenberg, Jakob, 4,372,228, Cl. 110-347.000.

Yoshida Kogyo K.K.: *See—*
Satoo, Masaharu, 4,372,999, Cl. 428-193.000.

Yoshida, Takao: *See—*
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,373,108, Cl. 568-817.000.

Yoshikawa, Mamoru: *See—*
Kubo, Kunimichi; Yoshikawa, Mamoru; Watanabe, Motokazu; Miyazaki, Yasunosuke; and Miyoshi, Mituji, 4,372,919, Cl. 422-137.000.

Yoshikumi, Chikao; Fujii, Takayoshi; Saito, Kenichi; Fujii, Masahiko; and Niimura, Koichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Platinum compound. 4,372,890, Cl. 260-429.00R.

Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Fujii, Takayoshi; Ikuzawa, Masanori; Matsunaga, Kenichi; Ando, Takao; and Ohhara, Minoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of saccharide and physiologically active agent containing the same. 4,372,948, Cl. 424-180.000.

Yoshino Kogyosho Co., Ltd.: *See—*
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,372,909, Cl. 264-521.000.

Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, to Yoshino Kogyosho Co., Ltd. Method of producing a bottle of saturated polyester resin. 4,372,909, Cl. 264-521.000.

Yoshizumi, Motohiko, to Mitsubishi Kinzoku Kabushiki Kaisha. Electroconductive powder and process for production thereof. 4,373,013, Cl. 428-570.000.

Young, Kenneth E., to Exxon Production Research Co. Emergency cable gripper. 4,372,706, Cl. 405-195.000.

Yu, Bu-Fan B.; and Goldman, Alex, to Spang Industries, Inc. Carbonate/hydroxide coprecipitation process. 4,372,865, Cl. 252-62.620.

Yukawa, Koji; Miyazaki, Masayuki; and Murahashi, Takashi, to Konishiroku Photo Industry Co., Ltd. Copying machine having detectors for the background color and density of the original. 4,372,674, Cl. 355-14.00D.

Yurdin, Carl, to Victoreen, Inc. Cardiac stress table. 4,372,551, Cl. 972-73.000.

Zamboni, Frank J., to Frank J. Zamboni & Co. Ice edger for ice resurfacing machine. 4,372,617, Cl. 299-24.000.

Zamory, William: *See—*
Lerman, Michael J.; and Zamory, William, 4,372,461, Cl. 220-260.000.

Zardi, Umberto, to Ammonia Casale S.A., a part interest. Axial-radial reactor for heterogeneous synthesis. 4,372,920, Cl. 422-148.000.

Zaydel, Wieslaw S., to General Motors Corporation. Tail lamp attachment. 4,372,718, Cl. 411-366.000.

Zeidler, Georg: *See—*
Eilingsfeld, Heinz; Hansen, Guenter; Seybold, Guenther; and Zeidler, Georg, 4,372,885, Cl. 260-158.000.

Zharov, Vladimir P. Laser-excited spectrophone. 4,372,149, Cl. 73-24.000.

Zientek, Lucy J.: *See—*
Chang, Tiang-Shing; Zientek, Lucy J.; Viningauz, Arthur; and Scheps, Marcy L., 4,373,036, Cl. 523-120.000.

Zimet, Elihu: *See—*
Toton, Edward T.; and Zimet, Elihu, 4,372,214, Cl. 102-305.000.

Zimmerman, George F.: *See—*
Hagelberg, Allen C.; Allardt, Clark E.; Lobitz, Walter A.; Thornburg, Robert O.; Zimmerman, George F.; Letterman, Gary L.; and Helbron, John W., 4,372,239, Cl. 114-20.00A.

Zimmerman, Robert L.: *See—*
Speranza, George P.; Cuscurida, Michael; and Zimmerman, Robert L., 4,373,034, Cl. 521-177.000.

Zink, Rudolf; and Loew, Peter, to Ciba-Geigy Corporation. Process for the production of carbinol bases from indoline compounds. 4,372,886, Cl. 260-165.000.

Zoecon Corporation: *See—*
Papanu, Steven C.; and Curtis, Ralston, 4,372,943, Cl. 424-78.000.

Zottino, Giuseppe: *See—*
Baldanello, Umberto; and Zottino, Giuseppe, 4,372,367, Cl. 160-310.000.

Zsolnay, Andrew, to Lockheed Corporation. Method of process control for thermosetting resins having addition-type reactions. 4,373,092, Cl. 528-481.000.

Zucker, Joseph; and Fitch, Arthur H., to GTE Automatic Electric Laboratories, Inc. Method of splicing ends of optical fibers. 4,372,768, Cl. 65-4.210.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF FEBRUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMP Incorporated: *See*—
Simmons, Reginald J., Re. 31,142, Cl. 339-74.00R.

Avtec Industries, Inc.: *See*—
Helwig, William F., Jr.; and Jeffries, Henry D., Jr., Re. 31,147, Cl. 361-42.000.

Bartels, Bernard E. Window shade, curtain, or drapery rod corner bracket. Re. 31,141, Cl. 248-270.000.

Bjorke, Merlin D., to Honeywell Inc. Interruptable signal generator. Re. 31,145, Cl. 307-608.000.

Feil, Thomas E., to Interconnect Planning Corporation. Multi-station telephone switching system. Re. 31,144, Cl. 179-99.0LS.

Gyursanszky, Zoltan L., to Honeywell Ltd. Two-wire ballast for fluorescent tube dimming. Re. 31,146, Cl. 315-276.000.

Helwig, William F., Jr.; and Jeffries, Henry D., Jr., to Avtec Industries, Inc. Ground fault and fire detector system. Re. 31,147, Cl. 361-42.000.

Honeywell Inc.: *See*—
Bjorke, Merlin D., Re. 31,145, Cl. 307-608.000.

Honeywell Ltd.: *See*—
Gyursanszky, Zoltan L., Re. 31,146, Cl. 315-276.000.

Interconnect Planning Corporation: *See*—
Feil, Thomas E., Re. 31,144, Cl. 179-99.0LS.

Jeffries, Henry D., Jr.: *See*—
Helwig, William F., Jr.; and Jeffries, Henry D., Jr., Re. 31,147, Cl. 361-42.000.

Kaye, Morton, deceased; and by Kaye, Sylvia, executrix. Measurement system. Re. 31,143, Cl. 356-381.000.

Kaye, Sylvia, executrix: *See*—
Kaye, Morton, deceased; and Kaye, Sylvia, executrix, Re. 31,143, Cl. 356-381.000.

Martinmaas, Werner W. Socket wrench with interchangeable sockets stored in handle. Re. 31,140, Cl. 81-177.00N.

Simmons, Reginald J., to AMP Incorporated. Electrical tab receptacle. Re. 31,142, Cl. 339-74.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Piercy, David R., to J. & S. Sieger Limited. Gas detection. B1 4,251,727, Cl. 250—343.

J. & S. Sieger Limited: See—
Piercy, David R. B1 4,251,727, Cl. 250—343.

LIST OF DESIGN PATENTEES

Ahn, Chong T. Music box. 267,885, 2-8-83, Cl. D17-24.000.

Albertini, Sauro. Fiber tipped pen. 267,886, 2-8-83, Cl. D19-43.000.

Albertson, Robert V. Forced air waste oil incinerator. 267,897, 2-8-83, Cl. D23-92.000.

Amana Refrigeration, Inc.: *See*—
Boldt, Melvin H.; Stevens, James P.; and Wojtowicz, Chester J., 267,851, Cl. D7-351.000.

American Can Company: *See*—
Schulz, Galyn A., 267,907, Cl. D59-2.00B.

Anderson, Arne E. E. Combined clasp and toggle for necktie or the like. 267,833, 2-8-83, Cl. D2-407.000.

Arai, Toshimitsu. Glass cutter. 267,853, 2-8-83, Cl. D8-51.000.

Arnseth, Arnette R.; and Celendano, Theresa A. Dress for the infirm. 267,830, 2-8-83, Cl. D2-82.000.

Astor, Barbara; and Snyder, Terry E., to Revlon, Inc. Display holder. 267,857, 2-8-83, Cl. D9-345.000.

Benichou, Henri, to Galerie Shirvane. Box for file cards. 267,836, 2-8-83, Cl. D3-78.000.

Benton, Charles C.: *See*—
Migani, Joseph C.; and Benton, Charles C., 267,837, Cl. D6-27.000.

Bevilaqua, Ernest M.; McCroskery, Allan L.; and Knerr, Theodore N., to Otis Elevator Company. Control panel for elevator systems. 267,870, 2-8-83, Cl. D13-35.000.

Bisacca, Mildred J.: *See*—
Witt, Frank H., Jr., 267,854, Cl. D9-307.000.

Boldt, Melvin H.; Stevens, James P.; and Wojtowicz, Chester J., to Amana Refrigeration, Inc. Combination microwave and convection oven. 267,851, 2-8-83, Cl. D7-351.000.

Brescia, Anthony J.; and Rhoads, Spencer, to Syroco, Inc. Storage unit. 267,842, 2-8-83, Cl. D6-131.000.

Brown, Wilbert C.; and Saba, Philip B., to TIE/Communications, Inc. Base for a telephone set. 267,873, 2-8-83, Cl. D14-60.000.

Buhk, Randall P.; Hozeski, Kenneth W.; and Karrip, Alex, to Steelcase Inc. Chair. 267,838, 2-8-83, Cl. D6-31.000.

Burian, Paul D.; and Rogers, Meyrick K., to Clairol Incorporated. Facial sauna. 267,898, 2-8-83, Cl. D23-148.000.

Celendano, Theresa A.: *See*—
Arnseth, Arnette R.; and Celendano, Theresa A., 267,830, Cl. D2-82.000.

Chiku, Akira: *See*—
Hosogai, Hideyuki; Chiku, Akira; and Kumano, Toshihiro, 267,878, Cl. D14-94.000.

Christian, Hubert E.: *See*—
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,849, Cl. D7-6.000.
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,850, Cl. D7-6.000.

Citizen Watch Company, Limited: *See*—
Kabaya, Harumichi, 267,859, Cl. D10-31.000.
Kabaya, Harumichi, 267,860, Cl. D10-32.000.

Clairol Incorporated: *See*—
Burian, Paul D.; and Rogers, Meyrick K., 267,898, Cl. D23-148.000.

Clayton Corporation: *See*—
French, Floyd R., 267,855, Cl. D9-434.000.

Cohen, Piet, to Materias Plasticas, Limitada. Towel rack. 267,840, 2-8-83, Cl. D6-99.000.

Cohen, Piet, to Materias Plasticas, Limitada. Shelf. 267,844, 2-8-83, Cl. D6-136.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; and Kobayashi, Kouichi, 267,863, Cl. D12-129.000.

Convergent Technologies, Inc.: *See*—
Keely, Leroy B.; Nuttall, Michael J.; and Moggridge, William G., 267,879, Cl. D14-100.000.

Current, Wayne A., to Singer Company, The. Sewing machine. 267,881, 2-8-83, Cl. D15-68.000.

Dairy Farm Leasing Company: *See*—
Keith, Alfred H., 267,905, Cl. D30-1.000.

Dart Industries Inc.: *See*—
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,849, Cl. D7-6.000.
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,850, Cl. D7-6.000.

Dowling, Jeanette M. Combined serving tray and condiment dishes. 267,848, 2-8-83, Cl. D7-3.000.
Eagle Aircraft Company: *See*—
Wilson, Weldon D., 267,868, Cl. D12-331.000.
England, Bert, to Towle Manufacturing Company. Knife or similar article. 267,852, 2-8-83, Cl. D7-137.000.
Ernst Leitz Wetzlar GmbH: *See*—
Uellenberg, Hans-Kurt; and Janke, Heinrich, 267,884, Cl. D16-8.000.
Fackert, James H. Foot operated lighting control. 267,871, 2-8-83, Cl. D13-36.000.
Flik, Inc.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 267,899, Cl. D26-40.000.
Forsberg, John R.: *See*—
Meisner, Edward H.; and Forsberg, John R., 267,902, Cl. D28-11.000.
French, Floyd R., to Clayton Corporation. Pressurized container piston. 267,855, 2-8-83, Cl. D9-434.000.
Fukushima, Hisao; and Hirooka, Junji, to Oki Electric Industry Co., Ltd. Car telephone set. 267,872, 2-8-83, Cl. D14-53.000.
Galerie Shirvane: *See*—
Benichou, Henri, 267,836, Cl. D3-78.000.
General Electric Co.: *See*—
Lenz, Henry G.; and Stewart, Earl K., 267,869, Cl. D13-1.000.
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., to Dart Industries Inc. Embossed beverage or packaging cup. 267,849, 2-8-83, Cl. D7-6.000.
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., to Dart Industries Inc. Embossed beverage or packaging cup. 267,850, 2-8-83, Cl. D7-6.000.
Gross, Jules P., to Pathfinder Auto Lamp Company; and National Rubber Company, Ltd. Automotive splash guard. 267,865, 2-8-83, Cl. D12-185.000.
GRRN Company: *See*—
Witt, Frank H., Jr., 267,854, Cl. D9-307.000.
Hagland, Kerstin M.: *See*—
Hanses, Ulf M.; and Hagland, Kerstin M., 267,892, Cl. D21-16.000.
Hailey, Ellis R. Basketball shooting toy. 267,891, 2-8-83, Cl. D21-2.000.
Hampel, Lance T.; and Sacia, Roger R., to L. T. Hampel Corp. Animal shelter. 267,904, 2-8-83, Cl. D30-1.000.
Hanses, Ulf M.; and Hagland, Kerstin M. Board for playing games. 267,892, 2-8-83, Cl. D21-16.000.
Heck, Bennett L. Pocket carrying case. 267,903, 2-8-83, Cl. D28-79.000.
Helene Curtis Industries, Inc.: *See*—
Meisner, Edward H.; and Forsberg, John R., 267,902, Cl. D28-11.000.
Hirooka, Junji: *See*—
Fukushima, Hisao; and Hirooka, Junji, 267,872, Cl. D14-53.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kimura, Kazutaka; and Yamamoto, Mituru, 267,862, Cl. D12-110.000.
Hosogai, Hideyuki; Chiku, Akira; and Kumano, Toshihiro, to MatsushitaGraphic Communication System. Facsimile transceiver. 267,878, 2-8-83, Cl. D14-94.000.
Hozeski, Kenneth W.: *See*—
Buhk, Randall P.; Hozeski, Kenneth W.; and Karrip, Alex, 267,838, Cl. D6-31.000.
Ishii, Motoko, to Motoko Ishii Lighting Design Incorporated. Lighting fixture. 267,900, 2-8-83, Cl. D26-83.000.
Janke, Heinrich: *See*—
Uellenberg, Hans-Kurt; and Janke, Heinrich, 267,884, Cl. D16-8.000.
Johnstonbaugh, Forrest C. Liquid ashtray. 267,901, 2-8-83, Cl. D27-08.000.
Kabaya, Harumichi, to Citizen Watch Company, Limited. Ring with watch. 267,859, 2-8-83, Cl. D10-31.000.
Kabaya, Harumichi, to Citizen Watch Company Limited. Wrist watch. 267,860, 2-8-83, Cl. D10-32.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Ohsawa, Eiichi, 267,861, Cl. D10-39.000.
Karrip, Alex: *See*—
Buhk, Randall P.; Hozeski, Kenneth W.; and Karrip, Alex, 267,838, Cl. D6-31.000.
Keely, Leroy B.; Nuttall, Michael J.; and Moggridge, William G., to Convergent Technologies, Inc. Computer keyboard or similar article. 267,879, 2-8-83, Cl. D14-100.000.
Keith, Alfred H., to Dairy Farm Leasing Company. Animal shelter. 267,905, 2-8-83, Cl. D30-1.000.
Kimura, Kazutaka; and Yamamoto, Mituru, to Honda Giken Kogyo Kabushiki Kaisha. Motor tricycle. 267,862, 2-8-83, Cl. D12-110.000.
Kloss Video Corporation: *See*—
Mitchell, Bernard; and Price, John F., 267,875, Cl. D14-79.000.
Knerr, Theodore N.: *See*—
Bevilaqua, Ernest M.; McCroskery, Allan L.; and Knerr, Theodore N., 267,870, Cl. D13-35.000.
Kobayashi, Kouichi: *See*—
Nakao, Shinroku; and Kobayashi, Kouichi, 267,863, Cl. D12-129.000.
Kolm, Eric A.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 267,899, Cl. D26-40.000.
Kolm, Henry H.; and Kolm, Eric A., to Flik, Inc. Electronic stroboscopic light. 267,899, 2-8-83, Cl. D26-40.000.
Kumano, Toshihiro: *See*—
Hosogai, Hideyuki; Chiku, Akira; and Kumano, Toshihiro, 267,878, Cl. D14-94.000.
L. T. Hampel Corp.: *See*—
Hampel, Lance T.; and Sacia, Roger R., 267,904, Cl. D30-1.000.
Lenger, Sidney A., Jr., to Singer Company, The. Bed headboard or similar article. 267,839, 2-8-83, Cl. D6-80.000.
Lenger, Sidney A., Jr., to Singer Company, The. Dresser or similar article. 267,845, 2-8-83, Cl. D6-154.000.
Lenz, Henry G.; and Stewart, Earl K., to General Electric Co. Housing for electric motor. 267,869, 2-8-83, Cl. D13-1.000.
Leslie, Dennis R. Combined support for beverage cooler and drinking glasses. 267,841, 2-8-83, Cl. D6-130.000.
Levine, Rosalie S.: *See*—
Witt, Frank H., Jr., 267,854, Cl. D9-307.000.
Litton Business Systems, Inc.: *See*—
Platner, Warren, 267,846, Cl. D6-161.000.
M/M Verdi International, Inc.: *See*—
Stark, Ted, 267,835, Cl. D3-71.000.
Malmin, John K., to Parker, Walter, a part interest. Television static electricity grounding rod. 267,876, 2-8-83, Cl. D14-90.000.
Marsden, Barbara B.: *See*—
Marsden, Floyd, 267,867, Cl. D12-317.000.
Marsden, Floyd, to Marsden, Barbara B. Sailing rig. 267,867, 2-8-83, Cl. D12-317.000.
Marshall, Eric J. Display terminal or similar article. 267,880, 2-8-83, Cl. D14-113.000.
Materias Plasticas, Limitada: *See*—
Cohen, Piet, 267,840, Cl. D6-99.000.
Cohen, Piet, 267,844, Cl. D6-136.000.
Matsui, Hidetoshi. Kinetic sculpture. 267,894, 2-8-83, Cl. D21-102.000.
MatsushitaGraphic Communication System: *See*—
Hosogai, Hideyuki; Chiku, Akira; and Kumano, Toshihiro, 267,878, Cl. D14-94.000.
McCroskery, Allan L.: *See*—
Bevilaqua, Ernest M.; McCroskery, Allan L.; and Knerr, Theodore N., 267,870, Cl. D13-35.000.
Meisner, Edward H.; and Forsberg, John R., to Helene Curtis Industries, Inc. Hair styling unit container. 267,902, 2-8-83, Cl. D28-11.000.
Migani, Joseph C.; and Benton, Charles C., to Migani, Joseph C. Heliodon. 267,837, 2-8-83, Cl. D6-27.000.
Mitchell, Bernard; and Price, John F., to Kloss Video Corporation. Projection television unit. 267,875, 2-8-83, Cl. D14-79.000.
Moggridge, William G.: *See*—
Keely, Leroy B.; Nuttall, Michael J.; and Moggridge, William G., 267,879, Cl. D14-100.000.
Motoko Ishii Lighting Design Incorporated: *See*—
Ishii, Motoko, 267,900, Cl. D26-83.000.
Nakao, Shinroku; and Kobayashi, Kouichi, to Combi Co., Ltd. Baby stroller. 267,863, 2-8-83, Cl. D12-129.000.
National Rubber Company, Ltd.: *See*—
Gross, Jules P., 267,865, Cl. D12-185.000.
Nuttall, Michael J.: *See*—
Keely, Leroy B.; Nuttall, Michael J.; and Moggridge, William G., 267,879, Cl. D14-100.000.
Nuttall, Michael W.; and Takahashi, Yuichi, to Tomy Kogyo Co., Inc. Wheeled toy figure. 267,896, 2-8-83, Cl. D21-161.000.
Ohsawa, Eiichi, to Kabushiki Kaisha Daini Seikosha. Wristwatch. 267,861, 2-8-83, Cl. D10-39.000.
Oki Electric Industry Co., Ltd.: *See*—
Fukushima, Hisao; and Hirooka, Junji, 267,872, Cl. D14-53.000.
Otis Elevator Company: *See*—
Bevilaqua, Ernest M.; McCroskery, Allan L.; and Knerr, Theodore N., 267,870, Cl. D13-35.000.
Parise, Carl; and Schulz, Rainer R., to Parise & Sons, Inc. Electrified vacuum hose for a wet/dry vaccum cleaner. 267,906, 2-8-83, Cl. D32-31.000.
Parise & Sons, Inc.: *See*—
Parise, Carl; and Schulz, Rainer R., 267,906, Cl. D32-31.000.
Parker, Walter: *See*—
Malmin, John K., 267,876, Cl. D14-90.000.
Parsons, Vaughan V. Boat. 267,866, 2-8-83, Cl. D12-311.000.
Pask, James B. Disposable boot. 267,832, 2-8-83, Cl. D2-271.000.
Pathfinder Auto Lamp Company: *See*—
Gross, Jules P., 267,865, Cl. D12-185.000.
Petrie, Patrick. Puzzle. 267,895, 2-8-83, Cl. D21-105.000.
Pielert, Fred T. Combined spice rack and storage unit. 267,847, 2-8-83, Cl. D6-188.000.
Platner, Warren, to Litton Business Systems, Inc. Desk or similar article. 267,846, 2-8-83, Cl. D6-161.000.
Price, John F.: *See*—
Mitchell, Bernard; and Price, John F., 267,875, Cl. D14-79.000.
Reese, Jens, to Siemens Aktiengesellschaft. Facsimilie transceiver. 267,877, 2-8-83, Cl. D14-94.000.
Revlon, Inc.: *See*—
Astor, Barbara; and Snyder, Terry E., 267,857, Cl. D9-345.000.
Rhoads, Spencer: *See*—
Brescia, Anthony J.; and Rhoads, Spencer, 267,842, Cl. D6-131.000.
Rigoni, Herbert. Pen. 267,887, 2-8-83, Cl. D19-49.000.
Rogers, Meyrick K.: *See*—
Burian, Paul D.; and Rogers, Meyrick K., 267,898, Cl. D23-148.000.
Saba, Philip B.: *See*—
Brown, Wilbert C.; and Saba, Philip B., 267,873, Cl. D14-60.000.
Sacia, Roger R.: *See*—
Hampel, Lance T.; and Sacia, Roger R., 267,904, Cl. D30-1.000.
Samuels, Alfred P., Jr. Hanging sign board. 267,889, 2-8-83, Cl. D20-41.000.
Samuels, Alfred P., Jr. Post supported sign board. 267,890, 2-8-83, Cl. D20-41.000.

Schouten, Henderikus P., to U.S. Philips Corporation. Clock radio receiver. 267,874, 2-8-83, Cl. D14-73.000.
Schulz, Galyn A., to American Can Company. Embossed paper toweling. 267,907, 2-8-83, Cl. D59-2.00B.
Schulz, Rainer R.: *See*—
Parise, Carl; and Schulz, Rainer R., 267,906, Cl. D32-31.000.
Schwartz, James P.: *See*—
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,849, Cl. D7-6.000.
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 267,850, Cl. D7-6.000.
Siemens Aktiengesellschaft: *See*—
Reese, Jens, 267,877, Cl. D14-94.000.
Singer Company, The: *See*—
Current, Wayne A., 267,881, Cl. D15-68.000.
Lenger, Sidney A., Jr., 267,839, Cl. D6-80.000.
Lenger, Sidney A., Jr., 267,845, Cl. D6-154.000.
Smith, Jack R. Beverage dispensing container. 267,856, 2-8-83, Cl. D9-337.000.
Snyder, Terry E.: *See*—
Astor, Barbara; and Snyder, Terry E., 267,857, Cl. D9-345.000.
Spates, Marian. Bottle. 267,858, 2-8-83, Cl. D9-373.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 267,835, 2-8-83, Cl. D3-71.000.
Steelcase Inc.: *See*—
Buhk, Randall P.; Hozeski, Kenneth W.; and Karrip, Alex, 267,838, Cl. D6-31.000.
Stevens, James P.: *See*—
Boldt, Melvin H.; Stevens, James P.; and Wojtowicz, Chester J., 267,851, Cl. D7-351.000.
Stewart, Earl K.: *See*—
Lenz, Henry G.; and Stewart, Earl K., 267,869, Cl. D13-1.000.
Sucato, Edward. Head cap for holding electrical probes and medical dispensers. 267,831, 2-8-83, Cl. D2-230.000.
Sundberg, Darrell W. Rack for appliances or the like. 267,843, 2-8-83, Cl. D6-132.000.
Susnjara, Kenneth J., to Thermwood Corporation. Industrial robot. 267,883, 2-8-83, Cl. D15-199.000.
Syroco, Inc.: *See*—
Brescia, Anthony J.; and Rhoads, Spencer, 267,842, Cl. D6-131.000.
Takahashi, Yuichi: *See*—
Nuttall, Michael W.; and Takahashi, Yuichi, 267,896, Cl. D21-161.000.
Thermwood Corporation: *See*—
Susnjara, Kenneth J., 267,883, Cl. D15-199.000.
TIE/Communications, Inc.: *See*—
Brown, Wilbert C.; and Saba, Philip B., 267,873, Cl. D14-60.000.
Tomy Kogyo Co., Inc.: *See*—
Nuttall, Michael W.; and Takahashi, Yuichi, 267,896, Cl. D21-161.000.
Towle Manufacturing Company: *See*—
England, Bert, 267,852, Cl. D7-137.000.
Uellenberg, Hans-Kurt; and Janke, Heinrich, to Ernst Leitz Wetzlar GmbH. Mirror reflex camera. 267,884, 2-8-83, Cl. D16-8.000.
U.S. Philips Corporation: *See*—
Schouten, Henderikus P., 267,874, Cl. D14-73.000.
Watanabe, Toshiyuki. Mudguard for a vehicle, or similar article. 267,864, 2-8-83, Cl. D12-185.000.
Williams, Eunice C. Decal or similar article for a vehicle body. 267,888, 2-8-83, Cl. D20-11.000.
Wilson, Weldon D., to Eagle Aircraft Company. Agricultural spray airplane. 267,868, 2-8-83, Cl. D12-331.000.
Winter, Frank N. Combined tanks and supporting structure for water-blast apparatus. 267,882, 2-8-83, Cl. D15-126.000.
Witt, Frank H., Jr., to Levine, Rosalie S.; Bisacca, Mildred J.; and GRRN Company, a part interest. Flask or similar article. 267,854, 2-8-83, Cl. D9-307.000.
Wojtowicz, Chester J.: *See*—
Boldt, Melvin H.; Stevens, James P.; and Wojtowicz, Chester J., 267,851, Cl. D7-351.000.
Yamamoto, Mituru: *See*—
Kimura, Kazutaka; and Yamamoto, Mituru, 267,862, Cl. D12-110.000.
Yew, Tow S. Doctor's attache case. 267,834, 2-8-83, Cl. D3-74.000.
Zeldin, Sharon E. Game board. 267,893, 2-8-83, Cl. D21-33.000.

LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree. 4,980, 2-8-83, Cl. 43.000.
Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,981, Cl. 73.000.
H. P. Metzler & Sons, Inc.: *See*—
Chamberlin, Thomas O., Sr., 4,980, Cl. 43.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Carnation plant. 4,981, 2-8-83, Cl. 73.000.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,981, Cl. 73.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 8, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19 4,371,983
20 4,371,984
22 4,371,985
051 4,371,986
162 4,371,987
167 4,371,988
227 4,371,989

CLASS 3

28 4,371,990

CLASS 4

255 4,371,991
353 4,371,992
448 4,371,993
490 4,371,994
538 4,371,995

CLASS 5

69 4,371,996
450 4,371,997
451 4,371,998
457 4,371,999

CLASS 6

10 4,372,000

CLASS 8

94.11 4,372,743
151 4,372,001
156 4,372,002
400 4,372,744

CLASS 15

88 4,372,003
182 4,372,004

CLASS 16

52 4,372,005
105 4,372,006
260 4,372,007

CLASS 17

32 4,372,008
44.1 4,372,009

CLASS 19

159 R 4,372,010

CLASS 24

20 TT 4,372,011
68 R 4,372,012
144 4,372,013
201 C 4,372,014
221 R 4,372,015
241 PS 4,372,016
277 4,372,017

CLASS 27

35 4,372,018

CLASS 29

1.23 4,372,019
81 H 4,372,020
235 4,372,021
243.58 4,372,022
256 4,372,023
260 4,372,024
407 4,372,025
426.5 4,372,026
448 4,372,027
460 4,372,028
564.4 4,372,029
569 R 4,372,030
571 4,372,031
4,372,032
4,372,033
577 C 4,372,034
596 4,372,035
603 4,372,036
613 4,372,037
623.2 4,372,038
734 4,372,039
741 4,372,040
747 4,372,041
825 4,372,042
828 4,372,043
845 4,372,044
846 4,372,045
852 4,372,046

CLASS 30

123.3 4,372,047
124 4,372,048

CLASS 33

36 4,372,049
174 G 4,372,050
174 R 4,372,051
349 4,372,052

CLASS 34

11 4,372,053
44 4,372,054
110 4,372,055

CLASS 36

7.7 4,372,056
10 4,372,057
32 R 4,372,058
4,372,059
54 4,372,060
117 4,372,061
120 4,372,062

CLASS 37

2 R 4,372,063
117.5 4,372,064

CLASS 38

15 4,372,065

CLASS 40

124.1 4,372,066
360 4,372,067
367 4,372,068
490 4,372,069
595 4,372,070
624 4,372,071

CLASS 43

21.2 4,372,072
57.1 4,372,073
69 4,372,074

CLASS 44

1 D 4,372,749
1 R 4,372,750
2 4,372,751
50 4,372,752
52 4,372,753

CLASS 46

1 K 4,372,075
20 4,372,076
116 4,372,077
150 4,372,078

CLASS 47

33 4,372,079
57.6 4,372,080

CLASS 48

77 4,372,754
197 R 4,372,755
202 4,372,756

CLASS 49

8 4,372,081
62 4,372,082
462 4,372,083
477 4,372,084

CLASS 51

216 ND 4,372,085

CLASS 52

36 4,372,086
79.12 4,372,087
251 4,372,088
404 4,372,089
536 4,372,090
593 4,372,091
612 4,372,092
694 4,372,093
741 4,372,094

CLASS 53

79 4,372,095
88 4,372,096
405 4,372,097
412 4,372,098
415 4,372,099
428 4,372,100
435 4,372,101
474 4,372,102

CLASS 55

46 4,372,757
48 4,372,758
73 4,372,759
227 4,372,760
260 4,372,761
273 4,372,762
501 4,372,763

CLASS 56

14.4 4,372,103
341 4,372,104

CLASS 57

204 4,372,105
334 4,372,106
346 4,372,107
358 4,372,108
401 4,372,109

CLASS 60

262 4,372,110
274 4,372,111
323 4,372,112
325 4,372,113
4,372,114
520 4,372,115
525 4,372,116
562 4,372,117
583 4,372,118
600 4,372,119
605 4,372,120
606 4,372,121
634 4,372,122
639 4,372,123
648 4,372,124
660 4,372,125
669 4,372,126

CLASS 62

6 4,372,127
4,372,128
13 4,372,764
29 4,372,765
175 4,372,129
330 4,372,130
532 4,372,766

CLASS 63

12 4,372,131

CLASS 65

3.12 4,372,767
4.21 4,372,768
4,372,769
27 4,372,770
75 4,372,771
106 4,372,772
108 4,372,773
114 4,372,774

CLASS 66

84 A 4,372,132
120 4,372,133

CLASS 68

12 R 4,372,134
22 R 4,372,135

CLASS 70

14 4,372,136
41 4,372,137
56 4,372,138
383 4,372,139

CLASS 71

67 4,372,775
90 4,372,776
93 4,372,777
94 4,372,778

CLASS 72

53 4,372,140
131 4,372,141
319 4,372,142
343 4,372,143
352 4,372,144
387 4,372,145
453.13 4,372,146

CLASS 73

3 4,372,147
4 R 4,372,148
24 4,372,149
40.5 A 4,372,151
40.5 R 4,372,150
81 4,372,152
84 4,372,153
104 4,372,154
114 4,372,155
119 R 4,372,156
147 4,372,157
4,372,158
4,372,159
178 R 4,372,160
432 R 4,372,161
517 B 4,372,162
602 4,372,163
704 4,372,164
861.22 4,372,165
861.28 4,372,166
4,372,167
4,372,168
861.52 4,372,169
861.61 4,372,170
861.66 4,372,171
862.39 4,372,172
862.59 4,372,173
863.11 4,372,174
864.17 4,372,175

CLASS 74

409 4,372,176
501 M 4,372,177
512 4,372,178
579 E 4,372,179
606 R 4,372,180

CLASS 75

0.5 R 4,372,779
14 4,372,780
65 ZM 4,372,781
118 R 4,372,782
246 4,372,783

CLASS 81

57.39 4,372,181
177 N Re.31,140
426 4,372,182

CLASS 83

71 4,372,183
98 4,372,184
101 4,372,185

CLASS 84

1.15 4,372,186
1.16 4,372,187
276 4,372,189
383 R 4,372,190

CLASS 87

48 4,372,191

CLASS 89

1.8 4,372,192

CLASS 91

420 4,372,193

CLASS 92

176 4,372,194

CLASS 98

115 R 4,372,195
116 4,372,196
118 4,372,197

CLASS 99

340 4,372,198
341 4,372,199
404 4,372,200

CLASS 100

7 4,372,201
53 4,372,202

CLASS 101

124 4,372,203
145 4,372,204
153 4,372,205
228 4,372,206
365 4,372,207
366 4,372,208
409 4,372,209

CLASS 102

204 4,372,210
207 4,372,211
264 4,372,212
301 4,372,213
305 4,372,214
387 4,372,215
489 4,372,216
521 4,372,217

CLASS 104

88 4,372,218
165 4,372,219

CLASS 105

215 C 4,372,220

CLASS 106

100 4,372,784
170 4,372,785
900 4,372,786

CLASS 108

51.3 4,372,221
137 4,372,222
143 4,372,223
159 4,372,224

CLASS 109

19 4,372,225

CLASS 110

238 4,372,226
342 4,372,227
347 4,372,228

CLASS 111

86 4,372,229

CLASS 112

139 4,372,230
158 B 4,372,231
158 E 4,372,232
235 4,372,233
258 4,372,234
273 4,372,235
291 4,372,236
308 4,372,237
439 4,372,238

CLASS 114

20 A 4,372,239
56 4,372,240
162 4,372,241
222 4,372,242
244 4,372,359
364 4,372,243

CLASS 118

46 4,372,244
56 4,372,245
60 4,372,246
116 4,372,247
720 4,372,248

CLASS 119

14.17 4,372,249
14.47 4,372,250
16 4,372,251
51 R 4,372,252

CLASS 122

7 R 4,372,253
26 4,372,254
149 4,372,255

CLASS 123

23 4,372,256
68 4,372,257
73 AD 4,372,258
79 R 4,372,259
142.5 E 4,372,260
4,372,261
179 J 4,372,262
179 SE 4,372,263
255 4,372,264
352 4,372,265
357 4,372,266
366 4,372,267
383 4,372,268
436 4,372,269
440 4,372,270
445 4,372,271
467 4,372,272
490 4,372,273
491 4,372,274
522 4,372,275
525 4,372,276
557 4,372,278
4,372,279
4,372,280
571 4,372,277

CLASS 124

16 4,372,281
24 R 4,372,282
56 4,372,283
78 4,372,284
90 4,372,285

CLASS 126

77 4,372,286
79 4,372,287
143 4,372,288
292 4,372,289
355 4,372,290
443 4,372,291
450 4,372,292

CLASS 128

1 R 4,372,293
1.1 4,372,294
4 4,372,295
24 A 4,372,296
64 4,372,297
80 A 4,372,299
80 C 4,372,298
83 4,372,300
94 4,372,301
130 4,372,302
132 D 4,372,303
214 B 4,372,305
214 E 4,372,304
214 G 4,372,306
224 4,372,307
283 4,372,308
284 4,372,309
4,372,310
287 4,372,311
290 R 4,372,312
295 4,372,313
296 4,372,314
303.18 4,372,315
325 4,372,316
330 4,372,317
403 4,372,318
421 4,372,319
455 4,372,320
463 4,372,321
491 4,372,322
660 4,372,323
695 4,372,324
763 4,372,325

CLASS 131

84 B 4,372,326
95 4,372,327
332 4,372,328

CLASS 132

40 4,372,329
53 4,372,330
88.7 4,372,331

CLASS 134

1 4,372,787
4 4,372,788

CLASS 137

1 4,372,332
4,372,333
12 4,372,334
101 4,372,335
205 4,372,336
240 4,372,337
4,372,338
288 4,372,339
576 4,372,340
580 4,372,341
601 4,372,342
614.2 4,372,343
615 4,372,344
636 4,372,345

CLASS 139

353 4,372,346
420 C 4,372,347
435 4,372,348
452 4,372,349

CLASS 140

112 4,372,350
4,372,351

CLASS 141

1 4,372,352
206 4,372,353
361 4,372,354

CLASS 142

55 4,372,355
56 4,372,356

CLASS 144

114 R 4,372,357
117 R 4,372,358

CLASS 145

2 R 4,372,360
61 R 4,372,361
63 4,372,362

CLASS 148

3 4,372,789
16.5 4,372,790
171 4,372,791

CLASS 150

4 4,372,363
52 R 4,372,364

CLASS 152

158 4,372,365

CLASS 156

48 4,372,792
66 4,372,793
73.1 4,372,794
155 4,372,795
187 4,372,796
249 4,372,797
273.1 4,372,798
285 4,372,799
307.3 4,372,800
434 4,372,801
538 4,372,802
626 4,372,803
631 4,372,804
642 4,372,805
643 4,372,806
4,372,807
655 4,372,808
656 4,372,809

CLASS 157

13 4,372,366

CLASS 160

310 4,372,367

CLASS 162

23 4,372,810
38 4,372,811
40 4,372,812
48 4,372,813
124 4,372,814
158 4,372,815
343 4,372,816

CLASS 164

332 4,372,368
482 4,372,369

CLASS 165

8 4,372,370
9 4,372,371
47 4,372,372
54 4,372,373
70 4,372,374
4,372,375
104.12 4,372,376
104.26 4,372,377

CLASS 166

57 4,372,378
68.5 4,372,379
250 4,372,380
263 4,372,381
264 4,372,382
266 4,372,383
278 4,372,384
281 4,372,385
300 4,372,386
334 4,372,387
4,372,388
369 4,372,389
373 4,372,390
4,372,391
4,372,392
382 4,372,393

CLASS 169

30 4,372,394
69 4,372,395

CLASS 172

1 4,372,396
42 4,372,397

CLASS 174

48 4,373,111
65 R 4,373,112
179 4,373,113

CLASS 175

45 4,372,398
65 4,372,399
107 4,372,400
209 4,372,401
318 4,372,402
343 4,372,403
374 4,372,404

CLASS 177

25 4,372,405
212 4,372,406

CLASS 178

17 D 4,373,114

CLASS 179

1 GS 4,373,115
1 SM 4,373,116
2 DP 4,373,117
77 4,373,118
99 LS Re.31,144
110 A 4,373,119
175 4,373,120
175.3 F 4,373,121

CLASS 180

6.2 4,372,407
4,372,408
54 A 4,372,409
89.12 4,372,410
89.15 4,372,411
90 4,372,412
152 4,372,413
165 4,372,414
215 4,372,415
4,372,416
4,372,417
256 4,372,418
289 4,372,419

CLASS 181

120 4,372,420
243 4,372,421

CLASS 182

5 4,372,422
42 4,372,423
119 4,372,424
179 4,372,425

CLASS 187

1 R 4,372,426

CLASS 188

72.1 4,372,427
73.35 4,372,428
322.12 4,372,429
329 4,372,430
380 4,372,431

CLASS 192

8 C 4,372,432
18 R 4,372,433
85 AA 4,372,434

CLASS 198

356 4,372,435
377 4,372,436
380 4,372,437
459 4,372,438
470 4,372,439
728 4,372,440
781 4,372,441
790 4,372,442

CLASS 200

159 A 4,373,123
159 B 4,373,122
4,373,124

CLASS 202

83 4,372,818
239 4,372,819
248 4,372,820
263 4,372,821

CLASS 203

19 4,372,822

CLASS 204

2.1 4,372,823
25 4,372,824
27 4,372,825
43 T 4,372,826
95 4,372,827
103 4,372,828
109 4,372,829
110 4,372,830
129.8 4,372,831
157.1 R 4,372,832
4,372,833
4,372,834
159.13 4,372,835
159.23 4,372,836
186 4,372,837

CLASS 205

264 4,372,443
505 4,372,444
532 4,372,445
586 4,372,446
812 4,372,447

CLASS 208

10 4,372,838
59 4,372,839
113 4,372,840
4,372,841
254 H 4,372,842

CLASS 209

86 4,372,846
4,372,847
90 4,372,848
167 4,372,849
198.3 4,372,850
199 4,372,851
222 4,372,852
232 4,372,853
242.3 4,372,854
316 4,372,855
603 4,372,856
673 4,372,857
674 4,372,858
739 4,372,859
748 4,372,860

CLASS 211

41 4,372,448
86 4,372,449
87 4,372,450
187 4,372,451

CLASS 212

159 4,372,452

CLASS 215

13 R 4,372,453
100 A 4,372,454
4,372,455
228 4,372,457
252 4,372,456

CLASS 219

60 A 4,373,125
69 E 4,373,127
69 M 4,373,126
73.11 4,373,128
79 4,373,129
203 4,373,130
216 4,373,131
421 4,373,132

CLASS 220

71 4,372,458
76 4,372,459
258 4,372,460
260 4,372,461
269 4,372,462

CLASS 221

10 4,372,463
14 4,372,464
131 4,372,465

CLASS 222

482 4,372,466
501 4,372,467

CLASS 224

268 4,372,468
321 4,372,469
324 4,372,470

CLASS 225

1 4,372,471
80 4,372,472

CLASS 227

3 4,372,473

CLASS 228

29 4,372,474
170 4,372,475

CLASS 229

16 A 4,372,476
39 R 4,372,477

CLASS 232

12 4,372,478
15 4,372,479
28 4,372,480
34 4,372,481
36 4,372,482

CLASS 235

383 4,373,133
386 4,373,134

CLASS 236

1 G 4,372,485
92 B 4,372,486

CLASS 237

56 4,372,487

CLASS 238

8 4,372,488
10 F 4,372,489

CLASS 239

59 4,372,490
102 4,372,491
168 4,372,492
208 4,372,493
553.3 4,372,494

CLASS 241

28 4,372,495
37 4,372,496

CLASS 242

7.03 4,372,497
47.01 4,372,498
90 4,372,499
55 4,372,500
107 4,372,501
149 4,372,502
183 4,372,503
198 4,372,504

CLASS 244

53 B 4,372,505
100 R 4,372,506
113 4,372,507
122 AG 4,372,508

CLASS 248

27.1 4,372,509
58 4,372,510
68 R 4,372,511
97 4,372,512
146 4,372,513
163 R 4,372,514
178 4,372,515
235 4,372,516
267 4,372,517
270 Re.31,141
430 4,372,521
441 R 4,372,518
466 4,372,519
604 4,372,520

CLASS 249

18 4,372,522
79 4,372,523
4,372,524
102 4,372,525
119 4,372,526

CLASS 250

339 4,373,136
343 4,373,137
343 B1 4,251,727

CLASS 251

1 A 4,372,527
4 4,372,528
151 4,372,529
173 4,372,530
174 4,372,531
175 4,372,532

CLASS 252

29 4,372,861
33 4,372,862
51.5 A 4,372,863
61 4,372,864
62.62 4,372,865
70 4,372,866
91 4,372,867
102 4,372,868
174.16 4,372,869
180 4,372,870
299.61 4,372,871
313 R 4,372,872
389 R 4,372,873
413 4,372,875
430 4,372,876
455 Z 4,372,878
470 4,372,879
522 R 4,372,880
4,372,881
529 4,372,882

CLASS 254

93 HP 4,372,533
269 4,372,534
319 4,372,535

CLASS 256

64 4,372,536

CLASS 260

112 R 4,372,883
112.5 S 4,372,884
158 4,372,885
165 4,372,886
397.1 4,372,888
413 4,372,889
429 R 4,372,890
453 RZ 4,372,877
453 SP 4,372,891
458 C 4,372,892
465 E 4,372,893
941 4,372,894

CLASS 261

92 4,372,895
121 B 4,372,896
153 4,372,897

CLASS 264

22 4,372,898
25 4,372,899
45.3 4,372,900
46.5 4,372,901
65 4,372,902
109 4,372,903
134 4,372,904
249 4,372,905
256 4,372,906
265 4,372,907
292 4,372,908
521 4,372,909
532 4,372,910

CLASS 266

45 4,372,537
69 4,372,538
104 4,372,539
171 4,372,540
220 4,372,541
229 4,372,542
275 4,372,543
281 4,372,544

CLASS 267

8 R 4,372,545
100 4,372,546

CLASS 271

10 4,372,547
18.3 4,372,548
23 4,372,549
211 4,372,550

CLASS 272

112 4,372,552
119 4,372,553

CLASS 273

1 E 4,372,554
1.5 R 4,372,555
85 G 4,372,556
88 4,372,557
238 4,372,558
243 4,372,559
408 4,372,560
411 4,372,561

CLASS 277

34 4,372,562
117 4,372,563
235 B 4,372,564
236 4,372,565

CLASS 280

11.19 4,372,566
21 R 4,372,567
63 4,372,568
78 4,372,569
154.5 R 4,372,570
423 A 4,372,571
423 B 4,372,572
477 4,372,573
634 4,372,574
661 4,372,575
689 4,372,576
780 4,372,577
802 4,372,578
4,372,579
4,372,580

CLASS 282

27.5 4,372,581
4,372,582
4,372,583

CLASS 285

18 4,372,584
43 4,372,585
178 4,372,586
238 4,372,587

CLASS 289

8 4,372,588
13 4,372,589

CLASS 292

33 4,372,590
221 4,372,591
288 4,372,592
307 B 4,372,593
337 4,372,594

CLASS 293

131 4,372,595

CLASS 294

9 4,372,596
67 DA 4,372,597
87.2 4,372,598
4,372,599
4,372,600

CLASS 296

50 4,372,601
78 R 4,372,602
146 4,372,603

CLASS 297

162 4,372,604
192 4,372,605
265 4,372,606
325 4,372,607
361 4,372,608
362 4,372,609
367 4,372,610
371 4,372,611
374 4,372,612
481 4,372,613

CLASS 298

17 B 4,372,614

CLASS 299

2 4,372,615
5 4,372,616
24 4,372,617
31 4,372,618
43 4,372,619

CLASS 303

99 4,372,620

CLASS 307

277 4,373,138
350 4,373,139
351 4,373,140
4,373,141
608 Re.31,145

CLASS 308

2 R 4,372,621
4 A 4,372,622
6 C 4,372,623
187.1 4,372,628

CLASS 310

306 4,373,142
334 4,373,143

CLASS 312

223 4,372,629
231 4,372,630
4,372,631
311 4,372,632

CLASS 313

338 4,373,144
503 4,373,145

CLASS 315

209 R 4,373,146
276 Re.31,146

CLASS 318

48 4,373,147
254 4,373,148
281 4,373,149
336 4,373,150

CLASS 329

104 4,373,151

CLASS 339

5 M 4,372,633
17 C 4,372,634
45 M 4,372,635
74 R Re.31,142
237 4,372,636
244 R 4,372,637
273 F 4,372,638

CLASS 340

87 4,373,153
347 DD 4,373,152
4,373,154
623 4,373,155
703 4,373,156
805 4,373,157
825.3 4,373,158

CLASS 343

6.5 R 4,373,159
100 SA 4,373,160
717 4,373,161
771 4,373,162
842 4,373,163

CLASS 346

75 4,373,164

CLASS 350

3.7 4,372,639
6.3 4,372,640
96.12 4,372,641
4,372,642
96.14 4,372,643
96.20 4,372,644
96.30 4,372,645
96.31 4,372,646
96.33 4,372,647
4,372,648
162 SF 4,372,649
252 4,372,650
292 4,372,651
319 4,372,652
385 4,372,653
427 4,372,654

CLASS 351

206 4,372,655

CLASS 352

57 4,372,656

CLASS 354

53 4,372,657
63 4,372,658
80 4,372,659
180 4,372,660
204 4,372,661
273 4,372,662
286 4,372,663
288 4,372,664
298 4,372,665
4,372,666

CLASS 355

1 4,372,667
3 R 4,372,668
4,372,669
8 4,372,670
4,372,671
14 C 4,372,676
14 D 4,372,674
14 FU 4,372,675
14 R 4,372,672
4,372,673
37 4,372,678
41 4,372,677
70 4,372,679

CLASS 356

51 4,372,680
72 4,372,681
244 4,372,682
338 4,372,683
348 4,372,684
350 4,372,685
381 Re.31,143

CLASS 357

13 4,373,165
15 4,373,166
24 4,373,167

CLASS 358

19 4,373,168
104 4,373,169

CLASS 360

71 4,373,170
4,373,171
105 4,373,172
121 4,373,173

CLASS 361

42 Re.31,147
149 4,373,174
220 4,373,175
433 4,373,176
433 A 4,373,177

CLASS 362

280 4,373,178

CLASS 364

200 4,373,179
4,373,180
4,373,181
4,373,182
4,373,183
431.06 4,373,187
434 4,373,184
478 4,373,185
551 4,373,186
552 4,373,188
602 4,373,189
715 4,373,190
724 4,373,191
900 4,373,192
4,373,193
4,373,194

CLASS 365

154 4,373,195
189 4,373,196

CLASS 366

220 4,372,686

CLASS 367

36 4,373,197
37 4,373,198

CLASS 368

28 4,372,687
65 4,372,688
155 4,372,689

CLASS 369

31 4,373,199
263 4,373,200

CLASS 371

68 4,373,201

CLASS 372

64 4,373,202

CLASS 374

29 4,372,690
44 4,372,691
104 4,372,692
111 4,372,693

CLASS 375

10 4,373,203
120 4,373,204

CLASS 376

349 4,372,911
381 4,372,912
417 4,372,817

CLASS 377

8 4,373,135

CLASS 384

94 4,372,624
129 4,372,625
4,372,626
260 4,372,627

CLASS 400

88 4,372,694
119 4,372,695
124 4,372,696
232 4,372,697
320 4,372,698
625 4,372,699

CLASS 401

157 4,372,700

CLASS 403

24 4,372,701
4,372,702
324 4,372,703

CLASS 405

19 4,372,705
195 4,372,706
224 4,372,707
225 4,372,704
261 4,372,708
282 4,372,709

CLASS 406

28 4,372,710
63 4,372,711
153 4,372,712
172 4,372,713

CLASS 409

293 4,372,714

CLASS 410

79 4,372,715
134 4,372,716
154 4,372,717

CLASS 411

366 4,372,718

CLASS 413

9 4,372,719
56 4,372,720

CLASS 414

5 4,372,721
44 4,372,722
111 4,372,723
281 4,372,724
460 4,372,725
517 4,372,726
537 4,372,727
590 4,372,728
700 4,372,729
786 4,372,730

CLASS 415

166 4,372,731

CLASS 416

14 4,372,732

CLASS 422

16 4,372,913
46 4,372,914
91 4,372,915
111 4,372,916
116 4,372,917
129 4,372,918
137 4,372,919
148 4,372,920
300 4,372,921

CLASS 423

112 4,372,922
4,372,923
179 4,372,924
226 4,372,925
244 4,372,926
4,372,927
249 4,372,928
323 4,372,929
326 4,372,930
329 4,372,931
351 4,372,932
365 4,372,933
4,372,934
393 4,372,935
450 4,372,936
454 4,372,937
469 4,372,938
478 4,372,939
567 A 4,372,940

CLASS 424

1 4,372,941
16 4,372,942
78 4,372,943
83 4,372,944
92 4,372,945
114 4,372,946
121 4,372,947
180 4,372,948
199 4,372,949
239 4,372,951
246 4,372,952
248.5 4,372,953
248.53 4,372,954
250 4,372,955
251 4,372,956
4,372,957
253 4,372,958
4,372,959
267 4,372,960
4,372,961
272 4,372,962
4,372,963
273 R 4,372,964
274 4,372,965
4,372,966
279 4,372,967
280 4,372,968
282 4,372,969
4,372,970
285 4,372,971
304 4,372,972
305 4,372,973
319 4,372,974
324 4,372,975
331 4,372,976
342 4,372,977
343 4,372,978

CLASS 425

60 4,372,733
131.1 4,372,734
135 4,372,735
149 4,372,736
393 4,372,737
451.9 4,372,738
466 4,372,739
544 4,372,740
556 4,372,741

CLASS 426

36 4,372,979
231 4,372,980
235 4,372,981
549 4,372,982
582 4,372,983
637 4,372,984

CLASS 427

38 4,372,985
40 4,372,986
42 4,372,987
52 4,372,988
53.1 4,372,989
4,372,990
140 4,372,991
185 4,372,992
193 4,372,993
195 4,372,994
300 4,372,995
328 4,372,996

CLASS 428

144 4,372,997
193 4,372,998
4,372,999
198 4,373,000
212 4,373,001
213 4,373,002
241 4,373,003
328 4,373,004
357 4,373,005
368 4,373,006
412 4,373,007
413 4,373,008
424.2 4,373,009
532 4,373,010
537 4,373,011
558 4,373,012
570 4,373,013

CLASS 429

13 4,373,014
57 4,373,015

CLASS 430

126 4,373,016
270 4,373,017
312 4,373,018
317 4,373,019
339 4,373,020
374 4,373,021
434 4,373,022

CLASS 434

199 4,372,742

CLASS 435

2 4,373,023
41 4,373,024
94 4,373,025
191 4,373,026
240 4,373,027
253 4,373,028
286 4,373,029

CLASS 436

66 4,372,746
67 4,372,747
73 4,372,748
176 4,372,874
537 4,372,745

CLASS 455

86 4,373,205
103 4,373,206
139 4,373,207
186 4,373,208
208 4,373,209
273 4,373,210

CLASS 494

14 4,372,484
16 4,372,483

CLASS 501

152 4,373,030

CLASS 521

32 4,373,031
38 4,373,032
70 4,373,033
177 4,373,034

CLASS 523

113 4,373,035
120 4,373,036
155 4,373,037
156 4,373,038
205 4,373,039
466 4,373,040

CLASS 524

77 4,373,041
100 4,373,042
130 4,373,043
132 4,373,044
141 4,373,045
285 4,373,046
371 4,373,047
4,373,048
375 4,373,049
405 4,373,050
427 4,373,051
451 4,373,052
457 4,373,053
460 4,373,054
505 4,373,055
547 4,373,056
700 4,373,057
705 4,373,058
761 4,373,059
767 4,373,060
4,373,061
841 4,373,062

CLASS 525

64 4,373,063
68 4,373,064
132 4,373,065
133 4,373,066
146 4,373,067
218 4,373,068
237 4,373,069
332.2 4,373,070
375 4,373,071
438 4,373,072
507 4,373,073

CLASS 526

92 4,373,074
230.5 4,373,075
261 4,373,076
309 4,373,077
317 4,373,078

CLASS 528

9 4,373,079
45 4,373,080
4,373,081
60 4,373,082
67 4,373,083
79 4,373,084
291 4,373,085
322 4,373,086
337 4,373,087
338 4,373,088
353 4,373,089
387 4,373,090
481 4,373,091
4,373,092
491 4,373,093

CLASS 536

6.4 4,373,094
7.1 4,373,095
20 4,373,096
26 4,373,097
101 4,373,098
105 4,373,099

CLASS 542

439 4,373,100
440 4,373,101

CLASS 544

143 4,373,102
195 4,373,103

CLASS 546

145 4,373,104

CLASS 548

468 4,372,887

CLASS 560

27 4,373,105

CLASS 564

85 4,373,106
473 4,373,107

CLASS 568

817 4,373,108

CLASS 585

640 4,373,109
719 4,373,110

CLASS 972

73 4,372,551

CLASSIFICATION OF DESIGNS

D2— 82 267,830
230 267,831
271 267,832
407 267,833
D3— 71 267,835
74 267,834
78 267,836
D6— 27 267,837
31 267,838
80 267,839
99 267,840
130 267,841
131 267,842
132 267,843
136 267,844
154 267,845
161 267,846
188 267,847
D7— 3 267,848
6 267,849
267,850
137 267,852
351 267,851
D8— 51 267,853
D9— 307 267,854
337 267,856
345 267,857
373 267,858
434 267,855
D10— 31 267,859
32 267,860
39 267,861
D12— 110 267,862
129 267,863
185 267,864
267,865
311 267,866
317 267,867
331 267,868
D13— 1 267,869
35 267,870
36 267,871
D14— 53 267,872
60 267,873
73 267,874
79 267,875
90 267,876
94 267,877
267,878
100 267,879
113 267,880
D15— 68 267,881
126 267,882
199 267,883
D16— 8 267,884
D17— 24 267,885
D19— 43 267,886
49 267,887
D20— 11 267,888
41 267,889
267,890
D21— 2 267,891
16 267,892
33 267,893
102 267,894
105 267,895
161 267,896
D23— 92 267,897
148 267,898
D26— 40 267,899
83 267,900
D27— 08 267,901
D28— 11 267,902
79 267,903
D30— 1 267,904
267,905
D32— 31 267,906
D59— 2 B 267,907

CLASSIFICATION OF PLANTS

P.— 43 4,980
73 4,981

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

8 : 4,373,193
01 : 4,372,028
4,372,192
4,372,216
4,372,252
4,372,812
4,372,929
4,373,117
04 : 4,371,994
4,372,068
4,372,182
4,372,278
4,372,633
4,372,636
4,373,152
4,373,173
4,373,183
4,373,191
05 : 4,372,422
06 : 4,371,984
4,371,985
4,371,989
4,371,995
4,371,999
4,372,007
4,372,013
4,372,015
4,372,023
4,372,032
4,372,036
4,372,037
4,372,060
4,372,063
4,372,070
4,372,071
4,372,074
4,372,076
4,372,078
4,372,110
4,372,123
4,372,129
4,372,138
4,372,144
4,372,147
4,372,150
4,372,162
4,372,163
4,372,166
4,372,167
4,372,168
4,372,169
4,372,186
4,372,187
4,372,195
4,372,200
4,372,212
4,372,239
4,372,248
4,372,279
4,372,298
4,372,305
4,372,307
4,372,317
4,372,359
4,372,363
4,372,386
4,372,423
4,372,435
4,372,452
4,372,468
4,372,474
4,372,483
4,372,506
4,372,517
4,372,520
4,372,550
4,372,556
4,372,557
4,372,566
4,372,593
4,372,594
4,372,605
4,372,617
4,372,622
4,372,624
4,372,632
4,372,638
4,372,639
4,372,646
4,372,681
4,372,683
4,372,684
4,372,688
4,372,690
4,372,693
4,372,707
4,372,715
4,372,717
4,372,722
4,372,731
4,372,733
4,372,741
4,372,743
4,372,751
4,372,753
4,372,768
4,372,786
4,372,796
4,372,801
4,372,803
4,372,808
4,372,817
4,372,838
4,372,847
4,372,852
4,372,872
4,372,874
4,372,877
4,372,884
4,372,914
4,372,915
4,372,921
4,372,932
4,372,943
4,372,981
4,372,985
4,373,009
4,373,011
4,373,039
4,373,057
4,373,067
4,373,071
4,373,079
4,373,092
4,373,109
4,373,125
4,373,182
4,373,197
4,373,198
4,373,202
08 : 4,372,102
4,372,543
4,372,615
4,372,671
4,372,672
4,372,755
4,372,823
4,372,979
4,373,118
09 : Re.31,143
4,372,016
4,372,091
4,372,175
4,372,247
4,372,318
4,372,320
4,372,352
4,372,361
4,372,432
4,372,454
4,372,487
4,372,496
4,372,691
4,372,736
4,372,759
4,372,767
4,373,006
4,373,014
4,373,143
10 : 4,372,243
4,372,778
4,372,848
4,373,049
4,373,084
4,373,098
11 : 4,372,291
12 : Re.31,141
4,372,018
4,372,024
4,372,042
4,372,059
4,372,064
4,372,145
4,372,219
4,372,241
4,372,263
4,372,285
4,372,299
4,372,354
4,372,465
4,372,513
4,372,585
4,372,725
4,372,825
4,372,843
4,372,941
4,373,058
4,373,119
4,373,129
4,373,141
4,373,148
4,373,155
4,373,181
13 : 4,372,001
4,372,069
4,372,105
4,372,314
4,372,321
4,372,364
4,372,476
4,372,512
4,372,539
4,372,542
4,372,600
4,372,601
4,372,631
4,372,833
16 : 4,372,184
4,372,260
17 : Re.31,147
4,371,986
4,372,006
4,372,008
4,372,073
4,372,097
4,372,100
4,372,118
4,372,146
4,372,156
4,372,193
4,372,288
4,372,289
4,372,297
4,372,300
4,372,303
4,372,306
4,372,313
4,372,340
4,372,344
4,372,376
4,372,397
4,372,408
4,372,410
4,372,429
4,372,446
4,372,451
4,372,455
4,372,459
4,372,462
4,372,478
4,372,479
4,372,503
4,372,516
4,372,519
4,372,572
4,372,590
4,372,611
4,372,658
4,372,716
4,372,720
4,372,766
4,372,798
4,372,814
4,372,832
4,372,856
4,372,861
4,372,876
4,372,991
4,372,995
4,373,025
4,373,114
4,373,123
4,373,135
4,373,156
18 : 4,372,113
4,372,154
4,372,229
4,372,269
4,372,355
4,372,356
4,372,514
4,372,531
4,372,604
4,372,887
4,372,903
4,372,944
4,373,047
19 : 4,372,009
4,372,099
4,372,339
4,372,366
4,372,573
4,372,851
4,373,099
20 : 4,372,198
4,372,330
4,372,453
21 : 4,372,139
4,372,697
4,372,699
4,372,730
22 : 4,372,026
4,372,180
4,372,333
4,372,338
4,372,553
4,372,596
4,372,705
4,372,757
4,372,840
4,372,841
4,372,924
4,373,005
23 : 4,373,001
24 : 4,372,211
4,372,213
4,372,214
4,372,217

4,372,268
4,372,287
4,372,329
4,372,888
4,372,992
4,373,035
4,373,189
4,373,190
25 : 4,372,038
4,372,054
4,372,086
4,372,095
4,372,128
4,372,141
4,372,164
4,372,254
4,372,294
4,372,304
4,372,369
4,372,464
4,372,511
4,372,546
4,372,559
4,372,587
4,372,652
4,372,679
4,372,747
4,372,769
4,372,791
4,372,917
4,372,945
4,372,996
4,373,023
4,373,031
4,373,040
4,373,146
4,373,163
4,373,176
4,373,177
4,373,178
4,373,207
26 : 4,372,066
4,372,112
4,372,120
4,372,122
4,372,142
4,372,155
4,372,202
4,372,261
4,372,265
4,372,271
4,372,272
4,372,374
4,372,409
4,372,421
4,372,430
4,372,469
4,372,480
4,372,481
4,372,568
4,372,575
4,372,603
4,372,610
4,372,612
4,372,629
4,372,718
4,372,738
4,372,748
4,372,855
4,372,900
4,372,960
4,372,966
4,373,134
4,373,145
4,373,186
27 : Re.31,145
4,371,997
4,372,040
4,372,136
4,372,251
4,372,345
4,372,441

4,372,460
4,372,567
4,372,582
4,372,635
4,372,649
4,372,665
4,372,666
4,372,729
4,372,867
4,372,982
4,372,997
4,373,020
4,373,077
4,373,127
4,373,147
4,373,162
4,373,175
4,373,201
28 : 4,372,022
4,372,035
29 : 4,372,025
4,372,290
4,372,296
4,372,336
4,372,492
4,372,630
4,372,775
4,372,777
31 : 4,372,445
4,372,536
4,372,561
32 : Re.31,140
33 : 4,372,116
4,372,325
4,372,540
4,372,732
4,372,735
4,373,210
34 : 4,372,048
4,372,072
4,372,075
4,372,098
4,372,126
4,372,227
4,372,231
4,372,232
4,372,233
4,372,234
4,372,237
4,372,283
4,372,311
4,372,322
4,372,447
4,372,450
4,372,461
4,372,500
4,372,502
4,372,535
4,372,554
4,372,591
4,372,641
4,372,643
4,372,645
4,372,703
4,372,745
4,372,750
4,372,760
4,372,771
4,372,788
4,372,806
4,372,807
4,372,820
4,372,821
4,372,830
4,372,834
4,372,839
4,372,857
4,372,863
4,372,869
4,372,889
4,372,913
4,372,942

4,372,965
4,372,974
4,372,977
4,372,988
4,373,007
4,373,018
4,373,032
4,373,036
4,373,037
4,373,095
4,373,121
4,373,138
4,373,157
4,373,204
35 : 4,372,378
36 : Re.31,144
4,371,992
4,372,000
4,372,050
4,372,055
4,372,057
4,372,062
4,372,111
4,372,115
4,372,125
4,372,238
4,372,246
4,372,264
4,372,316
4,372,343
4,372,370
4,372,371
4,372,398
4,372,419
4,372,448
4,372,467
4,372,495
4,372,551
4,372,597
4,372,627
4,372,656
4,372,668
4,372,669
4,372,670
4,372,675
4,372,677
4,372,742
4,372,822
4,372,835
4,372,976
4,373,021
4,373,045
4,373,052
4,373,055
4,373,060
4,373,061
4,373,064
4,373,065
4,373,103
4,373,115
4,373,120
4,373,131
4,373,140
4,373,158
37 : 4,372,029
4,372,079
4,372,171
4,372,222
4,372,236
4,372,351
4,372,555
4,372,637
4,372,737
4,372,957
39 : 4,371,991
4,372,033
4,372,039
4,372,051
4,372,053
4,372,190
4,372,199
4,372,353

4,372,377
4,372,449
4,372,507
4,372,533
4,372,583
4,372,653
4,372,696
4,372,713
4,372,721
4,372,763
4,372,773
4,372,789
4,372,794
4,372,910
4,372,933
4,372,934
4,372,951
4,373,051
4,373,068
4,373,075
4,373,082
4,373,093
4,373,142
40 : 4,371,993
4,372,014
4,372,196
4,372,197
4,372,282
4,372,331
4,372,380
4,372,387
4,372,388
4,372,391
4,372,392
4,372,562
4,372,704
4,372,787
4,372,842
4,372,844
4,372,901
4,372,937
4,373,024
4,373,041
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37 : 267,839

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40 : 267,889
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